Design and Implementation of an Automated Library Management System

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APPROVAL

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DECLARATION

We, hereby, declare that the work presented in this report is the outcome is the investigation performed by us under the supervision of **Nabila Anwar, Lecturer,** Department of Computer Science and Engineering, Sonargaon University, Dhaka, Bangladesh. We reaffirm that no part of this project and thereof has been of this being submitted elsewhere for the award of any degree of diploma.

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ABSTRACT

Online Library Management System is a system which maintains the information about the books present in the library, their authors, the members of library to whom books are issued, library staff and all. This is very difficult to organize manually. Maintenance of all this information manually is a very complex task. Owing to the advancement of technology, organization of an Online Library becomes much simple. The Online Library Management has been designed to computerize and automate the operations performed over the information about the members, book issues and returns and all other operations. This computerization of library helps in many instances of its maintenances. It reduces the workload of management as most of the manual work done is reduced.

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LIST OF ABBREVIATIONS

CSS	Cascading Style Sheets
DOM	Document Object Model
GUI	Graphical User Interface
HTML	Hypertext Markup Language
LMS	Library Management System
MVC	Model View Controller
OPAC	Online Public Access Catalog
PHP	Hypertext Preprocessor

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The Library Management System is used to control the main functions of library. Acquiring stock, maintenance of stock, managing details regarding the members, collecting membership fee, calculating late fines etc. are the basic function of a library management system. Most of the libraries requires a software, developed to manage the functional activities of it like storing books, periodicals etc. This has helped the librarians to reduce the burden of work to a great extent. (Amit Kumar et al. 2019). Library is a fast growing organism.

The ancient Methods to maintain it are no longer dynamic and efficient. For expeditious retrieval and dissemination of information and better service for the clientele, application of modern techniques has become absolutely indispensable (Neelakandan et al., 2010).

Libraries can be divided into categories by several types, which are: Academic libraries, Corporate libraries, Government libraries such as national libraries, Historical society Libraries, Private libraries, Public libraries, School libraries, Special libraries, Digital, libraries. Picture (photograph) libraries, Slide libraries, Tool libraries, Architecture libraries, Fine arts libraries, Medical libraries, Theological libraries etc.

A library is comprised of the following sections, based on the services.

(i) Acquirement Section: The books demanded by different departments are done by the Acquirement section. University book center is also working in this section for supply of books to the libraries in this university. It enables the librarian to select & buy books, journals, and other resources and create a database of the same for easy book search.

(ii) Technical Section: To classify, catalogue, OPAC, Barcode etc. The documents of the University Library this section is working.

(iii) Circulation Section: This section provides documents to the members and users of library for home reading as well as reading in the library. The documents are arranged on the racks in stacks as per the Dewey Decimal Classification Scheme.

(iv) Periodical Section: To procure, maintain and arrange periodicals services to library members. Periodical section provides reference service with respect to the requirement of the reader. Reference section is attached to periodical section for convenience of the Library users.

(v) Databases: Databases like OPAC, CAB-CD ROM abstracting databases, DELNET

Online Network Service etc. are available for the library members.

Library management is a sub-discipline of institutional management that focuses on specific issues faced by libraries and library management professionals. Library management encompasses normal management tasks as well as intellectual freedom, anti-censorship, and fundraising tasks. Issues faced in library management frequently overlap those faced in management of non-profit organizations (Sharma et al., 2005). Library Management System is an application that portraits library system which could be generally small or medium in size. It is used by the librarian to categorically manage the library by the virtue of using a computerized system where he/she can record various transactions like issue of books, return of books, addition of new books, addition of new students etc. (Ashutosh and Ashish., 2011).

Books and user maintenance modules are also included in this system which would keep track of the users using the library and also a detailed description about the books a library contains. With this computerized system there will be no loss of book record or member record which generally happens when a non-computerized system is used. In addition, report module is also included in Library Management System. If user's position is admin, the users able to generate different kinds of reports like lists of users registered, list of books, Issue return reports. All these modules are able to help librarian to manage the library with more convenience and in a more efficient way as compared to library systems.

This system will be developed and designed to help librarian record every book transaction so as to reduce and destroy problem of loss of books and files in the library.

1.2 Statement of the Problem

Presently, transaction of books in the institutional libraries have been done manually in most cases, thereby taking more time for transaction like borrowing of books or return of books and also searching of member and books. Series of problems occur as a result of this thereby resulting to inefficient library management.in most cases as a result of Human error there maybe loss and damages of records due to not using a computerized system in the library. Nevertheless, the difficulty in the searching of books which could be termed to be limitations in book Management is a problem in the manual library thereby causing inefficiency and time consuming in the library. Also the problem of space consuming erupts after the number of records become large the space for physical storage of file and record also increases if no computerized system is implemented as well as the issue of cost. Due to problem of lack of prompt information retrieval and time wastage in using the library. In addition due to the troublesome, in this project computer approach will be used to solve these problems. Each of the manual procedure will be analyzed.

1.3 Aim and Objectives

The aim of this project is to develop a system that can handle and manage the activities involved in a library in an efficient and reliable way.

The objectives are:

- Designing a computerized library management system which would help clear out the problem faced in manual library.
- Implementing the system.
- Evaluating and testing the performance of the system.
- Manage the details of Address, Member, Issues, Books, Student.
- Manages all the information about Address, Librarian, Student, Address.

1.4 Purpose of the Project

The main purpose of this project is to develop a computerized system that will manage the activities in the library thereby providing easy access of library usage for librarian and users of the library, it will also help librarians keep track of library information etc. This system will also provide electronic means of storage and help librarians keep track of library information.

1.5 Scope of the Project

The project product to be produced is a Library Management System which automate the major library operations. The first subsystem is the registration of the users to the system to keep track of authorized users to the system. The second subsystem is the registration of new books into the library management system to know when new books are brought into the library. The third subsystem is a borrower and return of books which is the major area needed by the user. There are three end users for the Library Management System. The end users are the admin, users and members.

It includes:

- Create distinct product users based on their roles and permissions.
- Authenticate users at their login.
- Provide the list of books the users can borrow.
- Facility to reserve books that are available.
- A status page for all users to view books reserved by them.
- Facility to cancel the reservation for a book made earlier.
- A status page for all users to view books borrowed by them, their individual due dates and their individual penalties if any.
- An interface to view and edit the own profile.

- Provide method for adjusting account settings such as passwords.
- Mechanism to reset the password in case user forgets it.

1.6 Definition of Terms

For Librarian Control Panel view:

- Profile
- All Student Information
- All Teacher Information
- Manage Book
- Issue Book
- Manage Users
- Issued Book
- New Requested Book
- Thesis / Project Book
- Send Message to User

For User view:

- My Profile
- My Issued Books
- List of Books
- Thesis and Projects
- Request Book

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The Library Management System is a Library Management software for monitoring and controlling the transactions in a library (Ashutosh and Ashish., 2012). Library Management System supports the general requirement of the library such as the acquisition, cataloguing, circulation and other sections. Before the advent of computer in modern age there are different methods of keeping records in the library. Records are kept in the library on shelves and each shelf are labelled in an alphabetical or numerical order, in which the categories of books available are arranged on different position on the shelves and as well are recorded on the library manuscript and when any book is to be referenced the manuscript is being referred to, to know the position of such required book by the person that requested for the book. After the invention of computer different researchers have carried out various approach on an automated library management system in which this project is as well all about. The first library management system to be reviewed is the KOHA library management system. Since the original implementation in 1999, KOHA functionality has been adopted by thousands of libraries worldwide,each adding features and functions, deepening the capability of the system. With the 3.0 release in 2005, and the integration of the powerful Zebra indexing engine, KOHA became a viable, scalable solution for libraries of all kinds. LibLime KOHA is built on this foundation. With its advanced feature set, LibLime KOHA is the most functionally advanced open source Integrated Library System in the market today. The major setback of this Library Management System is that it is a web based and as a result it is not security conscious because hackers could have the database hacked and access or modify the information of such user. (wwwkoha.org). Another Library Management System is the Capitals library software with the following benefits Increases support available for staff and users in any modern library service, provides efficiency, innovative system thats saves library time and improves theuser experience. A library management system usually comprises a relational database, software to interact with that database, and two graphical user interfaces (one for users, one for staff). Most integrated library systems, separate software functions into discrete programs called modules, each of them integrated with a unified interface.

Examples of modules might include:

- Acquisitions (ordering, receiving, and invoicing materials)
- Cataloguing (classifying and indexing materials)

- Circulation (lending materials to patrons and receiving them back)
- Serials (tracking magazine and newspaper holdings)
- The OPAC (public interface for users)

The purpose of this literature review is to establish the potential topics and suggest ideas for another research, reporting published materials on existing conceptual framework, theories, techniques, processes, styles and instruments of other researchers related to the topic under investigation. It will help analyse scope of study and in determining the various variables to be included. As for this research, the main purpose of literature review will be to grasp comprehensive ideas on the extent of library management system initiatives and projects that had taken place worldwide and the factors and conditions that had influenced and contributed to their success. The approach to literature review is the browse method where print and electronic sources were looked at,read and digested, looking for some relevancy, appropriateness and usefulness of the topic at hand. Predetermined keywords to be used during this search are library, virtual library, e-library, hybrid library, library management initiatives, library management problems, library management research, library services, resource sharing, distributed information resources, online databases, library automation, library systems, mobile information access, information professionals, librarian, global access, repositories and interoperability, management systems, library integrated system, database system administration (DBSA). The literature review will be about development of library management system which is organized into the following sections namely introduction, Features of Library Management, Why we need library management system, A Review of Problems and Challenges of Library Professionals in Developing Countries, Library Management System Initiatives Worldwide (review of library management system).

2.2 Development of Library Management System

A library management system is a system for a library resource planning, used to access the documents held, orders, payment or lending all made by the clients. Sometime, a phrase like library integrated system is employed, especially in the UK. By the mid to late 2000s, library management system vendors not only the number of services offered but also their prices leading to some dissatisfaction among many smaller libraries. At the same time open source Integrated Library System was in its early stages of testing. Some libraries began to such open source integrated library system as KOHA and Evergreen. Most reasons noted from these were to avoid vendor lock in, license fees and participate in software development. The much needed freedom from vendors also allowed libraries to prioritize need according to urgency, as opposed to what their vendor can offer. Recently, libraries which have moved to open source integrated library system have found that vendors are now more likely to provide quality service in order to continue a partnership since they are no longer having the power of owing the Integrated Library System software and tying down libraries to strict contracts. This has been the case with

the SC LENDS consortium. Following the success of Evergreen for the Georgia PINES library consortium, the South Carolina States Library along with some local public libraries formed the SC LENDS consortium in order to share resources and to take advantage of the open source nature of the Evergreen Integrated Library System to meet their specific needs. By October 2011, just two years after SC LENDS began operations, thirteen public library systems across 15 counties had already joined the consortium in addition to the south Caroline State Library. Librarytechnology.org does an annual survey of over 1,500 libraries and noted in 2008, 2 % of those who surveyed use the Integrated Library System, in 2009 the number increased to 8% and in 2010(most recent year availabl e) 12% of the libraries polled had adopted open source Library Management System. Library project system that offers many flexible and convenient features, allowing librarians and library users to maximize time and efficiency. Library system gives all the detailed information about students, staffs and books, it will track the books available in the library and the books that have been issued to the library users (students). It shows popular books among the students. It will provide book lost in the library. It keeps records of the supplier and the book binders.

2.3 Features of library management

i. Manage Book and Member Record with help of Database.

ii. Acquisitions: With library Management software, Acquisitions function as generate Issued Books, Books, Thesis and Project, Request Book. Receive Request Order instantly available in Reports Data can be each by feeding ID number and Student name.

iii. Circulation: Library management Software enables the complete management of multiple Item issue and return of books using Manual.

iv. Databases: A library database system is an infrastructure that allows users to search books and book content, add/remove, and download selected books.

v. OPAC: Library management software admin/Member can easily search book

author, Title, URL No, Publication, and also admin can filter data with category wise

vi. Alert through Notification: Admin can send notification to members, vendors, or any other people from the software.

vii. Multiple Library Setup: Library management software can setup at different locations.

viii. Export All Report into database: Admin can take all the details which are displayed in the reports into excel and word file.

ix. Provide Multi User environment: Library management software gives facility of multi user environment. Multiple users can login at the same time in the Library management software.

x. Custom Field Indices : Library Software provides sorted data on required fields by clicking on the column header that is if clicked on Books the data will be sorted on Books.

xi. Lock System: Lock the subject or group of the member, so that media can't be issued which falls under this criteria. One can in this way restrict the issuing of the media.

xii. Circulation: Easy operation of circulation by entering the code of media, get all the information related to the media and the number.

xiii. Easy Navigation and Updating: Selecting an option from the given menu provides all the data related to that option in tabular format in a user friendly manner.

xiv. Customize: One can customize the system to feel easier for data entry also while adding records user can keep form in 'add' mode. Define Holidays. And Set the criteria of issuing the book if member is requested for media or not.

2.4 Needs for library management system

i. Improved students / Teachers services through greater access to accurate information.

ii. Increased productivity.

iii. More safer means of storing and keeping of information.

iv. Easier access to information like management reports and stock etc. as well as accurate and faster results from statistical analyses.

v. Reduces errors and eliminating of ennui of long and repetitive manual processing.

vi. Greater accountability and transparency in operations.

vii. Improved efficiency and effectiveness in administration and management as it has unprecedented access to real- time information.

viii. More reliable security for sensitive and confidential information.

ix. Appropriate knowledge–based action and intervention can now take place in a timelier manner.

2.5 Library management system initiatives worldwide

Neelakadan, Duraisekar, Balasubramani, and Srinivasa, (2010) in their study developed a system using KOHA Open source software to develop an updated database of books and other resources of the school of Chemistry Library, Bharathidasan University to implement automated system using KOHA library integrated Open source software to carry out the charging and discharging functions of the circulation section more effectively which provide various search options to know the availability of books in the library to generate the list of books due by a particular member and also the overdue charges. KOHA is being said to be an integrated software system with all the required models for small to very large libraries (Neelakandan et al., 2010).

The outcome that of the system they developed has: Chemistry library collections are in single database, it gives the full control over the library collections and operations, faculty members search and research scholars can check the required books by OPAC modules, research scholars and faculty members can check the status of their borrowed books, they can get the complete details about the books for their further reading and research, data entry of the books can be done through the downloading of bibliographic details from the library of congress and other catalogues and the library system developed can share their data with various library and other department in the libraries.

The limitations of his research was based on:

i. Lack of Infrastructure facility

ii. Lack of Environment support

iii. Lack of Financial Resources. Koy yeeh keat, (2011) in his research developed a library management system which could be mainly used by member and staff of the library. The system allows members search for books and reserve books through website so that they can save their time and cost to travel from one place to another to use the library as well as know what the book entails in the library. In the system developed, staffs can also be able to add news and also view reports with several criteria as well as add, edit and delete news. The system developed was aimed at allowing users to reserve books via online, to convenient user borrowing books via online, implementing email technologies to the website, implementing SMS technologies to the system, designing a friendly graphical interface which would suit the users.

In the designing of the system, various modules were considered which are the:

i. Authorization and authentication module

ii. Member/staff module

iii. Search module

iv. Books maintenance module

v. News maintenance module

vi. Email module

vii. Report modules

viii. Publisher maintenance module

ix. Employee maintenance module etc. The software used in the research entails the use of Microsoft products like the Microsoft visual studio 2008 for the website development and ASP.NET with C# as the programming language used having the Microsoft SQL server 2008 as the database.

Mainly the software and hardware requirement used in his research were:

i. Operating system: windows 7 professional.

ii. Database: MYSQL server 2008.

iii. Development tools and programming language: Microsoft visual studio 2008 and VB.NET .

iv. Processor: Intel core i2 duo CPU T7250 @ 2.00 GHz .

v. Ram: 2 GB The methodology used in the research was the waterfall model which entails the system planning,requirement analysis, system design, programming,system testing and the evaluation.

Ashutosh Tripathi, and Ashish Srivastaval, (2012) developed a system which is a library management software for monitoring controlling the transactions in a library. In their study they came up with a Library Management System which was developed in java and mainly focuses on basic operations in a library like adding new member, new books, and updating new information, searching books and members and facility to borrow and return books. The system these two developed was an automated Library Management System. In which through the software user can add members, add books, search members, search books, update information, edit information, borrow and return books in quick time. The system they developed has the following advantages. User friendly interface, Fast access to database, less error, More Storage Capacity, Search acility, Look and Feel Environment All the manual difficulties in managing the Library were rectified by implementing computerization.

The software which was designed can help users maintain and organize library making the software very easy to use for both beginners and advanced users. The system requirement for the research entails how the library management system that was designed can be used in windows 98 Windows2000, Windows XP and Windows NT, supported for other platform such as Applet Macintosh and UNIX. The system was made to run on Windows 98 or Windows NT4.0 operating system and met the following hardware requirements.

i. For Windows 95 based computers, a 486 / 66 MHz or higher processor with 8MB

ii. For Windows 98 based computers, a 500/88MHz or higher processor with 32 Mb of RAM

iii. For Windows NT based computers, a 488 / 66 MHz or higher processor with 16 MB of RAM

iv. For Windows 200 based computers, a 700/850 MHz or higher processor with 512 MB of RAM At the end of his research the combination of all the web pages he designed resulted in a web application named Library Management System, which works as online library. Several user friendly coding were also adopted. Prabhakar kumar, Rahul Kumar,Rajat Singh and Vikram Singh, (2014)developed a library management system which aims in developing a computerized system to maintain all the daily work of library. By the virtue of their research work, the system developed entails many features which are generally not available in normal library management systems like facility of user login and a facility of teachers login. The system developed also has a facility of admin login through which the admin can monitor the whole system etc.

The objectives of the system developed was aimed at:

i. Improvement in control and performance.

ii. Save cost.

iii. Save time.

iv. Option of online Notice board where Librarian will be able to provide a detailed description of workshops going in the college as well as in nearby colleges etc.

The software and hardware requirement in the designing of the system were:

i. Operating system- Windows 7

ii. Database - MYSQL-MYSQL

iii. Development tools and Programming language- HTML was used to write the whole code and develop webpages with CSS, java script for styling work and PHP for sever side scripting.

iv. Intel core i5 2nd generation is used as a processor

v. Ram 1 GB Sarawut Markchit, (2015) developed a system to identify the problem and obtain necessary requirements data from the librarians, analysis the obtain data, design and develop the system and conduct an assessment or survey from the users of library resources service

through websites and mobile systems with web services with regards overall performance of Suratthani Rajabhat University Central Library. Sarawut Markchit system was able to acquire material as quickly as possible, maintain a high level of accuracy in all work procedures, and keep work processes simple, in order to achieve the lowest possible unit cost and develop close, friendly working relationships with other library units and vendors. In his methodology he was able to make use qualitative methods using structured interviews. Information were being gathered by the virtue of this. The system was developed using some instruments used for the development which were visual studio .NET (ASP.NET) for web-based application, HTML5 for mobile application, web-service for data communication with the component and connected to staff system of this University, Microsoft SQL server for database management and longest matching algorithm for data retrieval.

CHAPTER 3

SYSTEM ANALYSIS AND DESIGN

3.1 Introduction

To develop a best fit system to the automated library, there are three stages of developing the new system. they are gather information, design and implementation and final testing.Within these three sections, different tactics will be adopted so that we can design a system that can maintain high usability and accessibility.

Below are some ideas to the process:

3.2 Information Gathering

Before setting up the system by software development tools, information will be gathered from the staff about the need for the users of the system like the staff of library and those readers by using qualitative gathering techniques. After considering the scope and the objectives of this study, it is very much ideal to use the qualitative gathering techniques method. The library is a major means of data gathering and as well a case study for the proposed system. In line with this the major method of information gathering for the system is the library and observation method via observing the staff and operation of the library.

3.3 Analysis of Existing System

The existing system of library management system involves lots and lots of paper work. The system involves that all library user details will be taken on a white and black method. To issue books and view Thesis or Project books from a library a students and teachers information is being taken for every registered user and can actually sign out for return of the book once he/she is completed.

3.3.1 Problems of existing system

Having have the overview knowledge of the existing system, the following are its problem:

A lot of paper works are needed for the safe keeping of the details of books issued by a registered user. User time are wasted as a result of searching for a book that has been issued by a user whose record cannot be traced on the paper records. The existing system of operation is

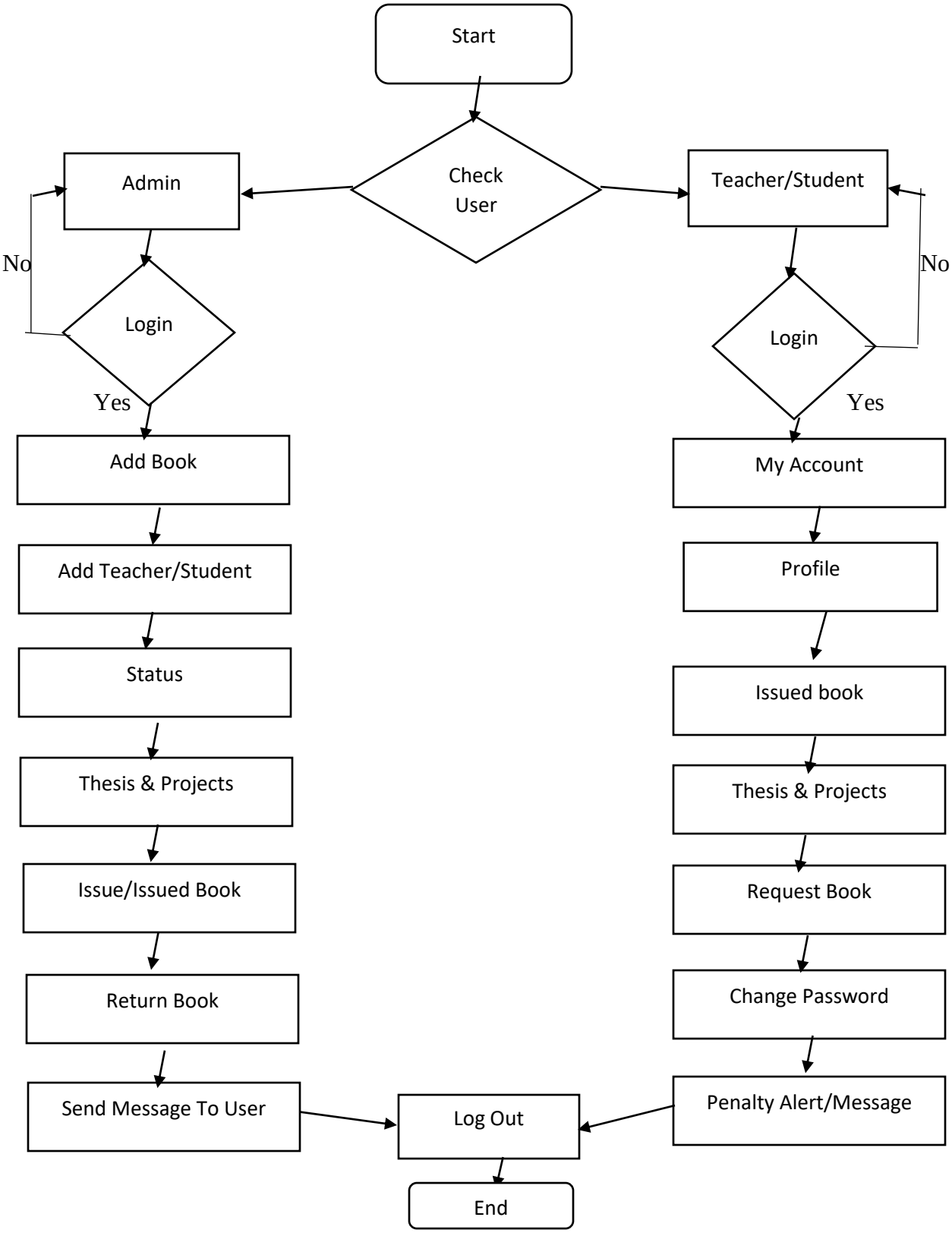
prone to error. It is tedious because it must take a routine. The processing speed is very low resulting into low output.

3.3.2 Analysis of the Present System

To analysis the present software, we can see various School, College or University. We can see how they maintained the system and gathered information. We identified a number of drawbacks of present online system. To gather a thorough understanding of the existing system we used FLOW CHART and ER-Diagram.

3.3.3 Flow Chart

At this stage we designed a system that tries to eliminate the identified drawbacks. We determine the tables that must be stored in the database.



3.3.3 Fig Flow Chart

3.3.4 System Implementation

The system is implemented using Prototyping Model. We create tables by code first approach and back in MySQL. The forms to take input and to perform a number of operations were designed. The basic idea here is that instead of freezing the requirements before a design or coding can proceed, a throwaway prototype is built to understand the requirements. This prototype is developed based on the currently known requirements. By using this prototype, the client can get an "actual feel" of the system, since the interactions with prototype can enable the client to better understand the requirements of the desired system. Prototyping is an attractive idea for complicated and large systems for which there is no manual process or existing system to help determining the requirements. The prototypes are usually not complete systems and many of the details are not built in the prototype. The goal is to provide a system with overall functionality.

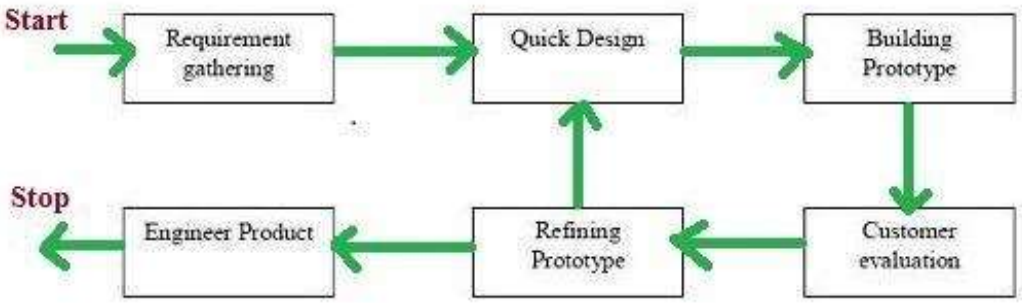


Fig:- Prototyping Model

3.3.4.1 Advantages of Prototype model

Users are actively involved in the development

Since in this methodology a working model of the system is provided, the users get a better understanding of the system being developed.

Errors can be detected much earlier.

Quicker user feedback is available leading to better solutions.

Missing functionality can be identified easily

Confusing or difficult functions can be identified Requirements validation, Quick implementation of, incomplete, but functional, application.

3.3.4.2 Disadvantages of Prototype model

- Leads to implementing and then repairing way of building systems.
- Practically, this methodology may increase the complexity of the system as scope of the system may expand beyond original plans.
- Incomplete application may cause application not to be used as the full system was designed Incomplete or inadequate problem analysis.

3.3.4.3 When to use Prototype model

- Prototype model should be used when the desired system needs to have a lot of interaction with the end users.
- Typically, online systems, web interfaces have a very high amount of interaction with end users, are best suited for Prototype model. It might take a while for a system to be built that allows ease of use and needs minimal training for the end user.
- Prototyping ensures that the end users constantly work with the system and provide a feedback which is incorporated in the prototype to result in a useable system. They are excellent for designing good human computer interface systems.

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3.4 Use Case Diagram

3.4.1 Use Case Diagram of Students

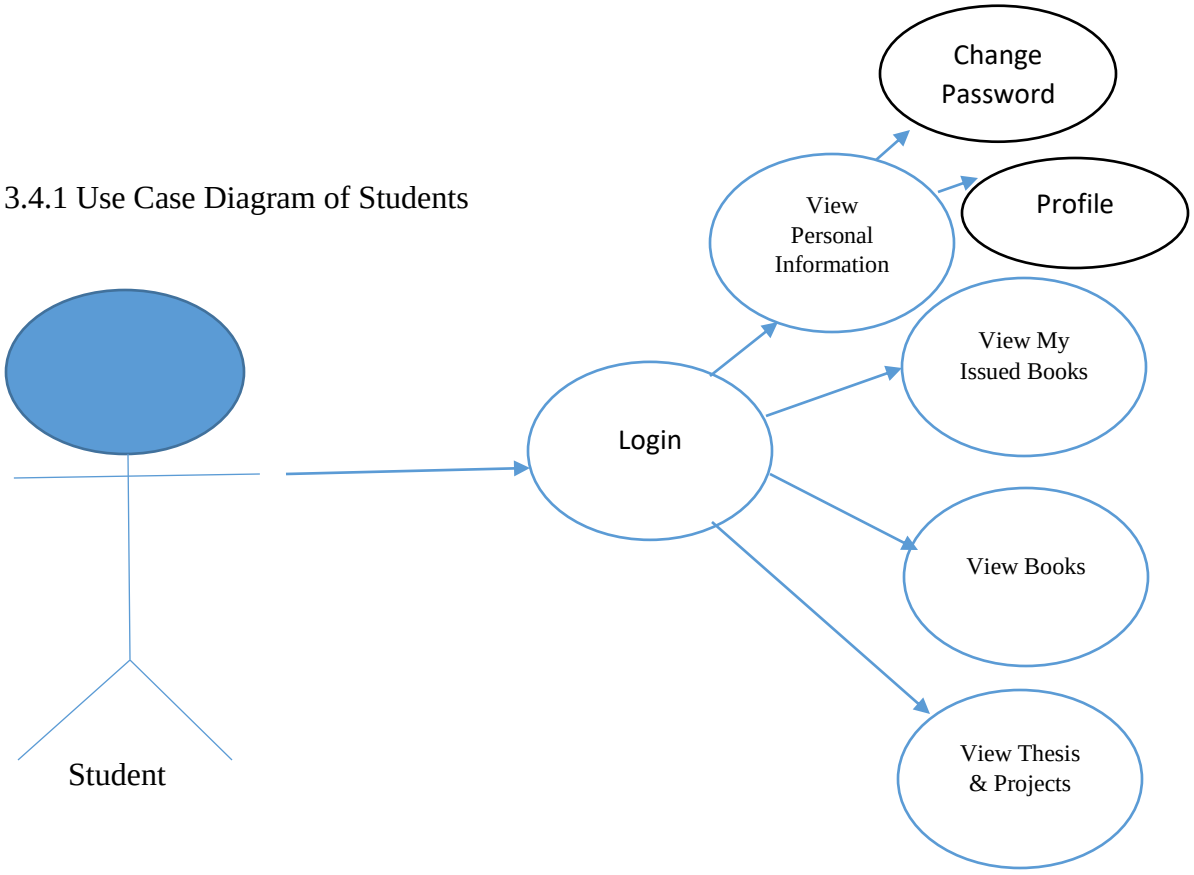


Fig: Use Case Diagram of Students (User)

3.4.2 Use Case Diagram of Teacher

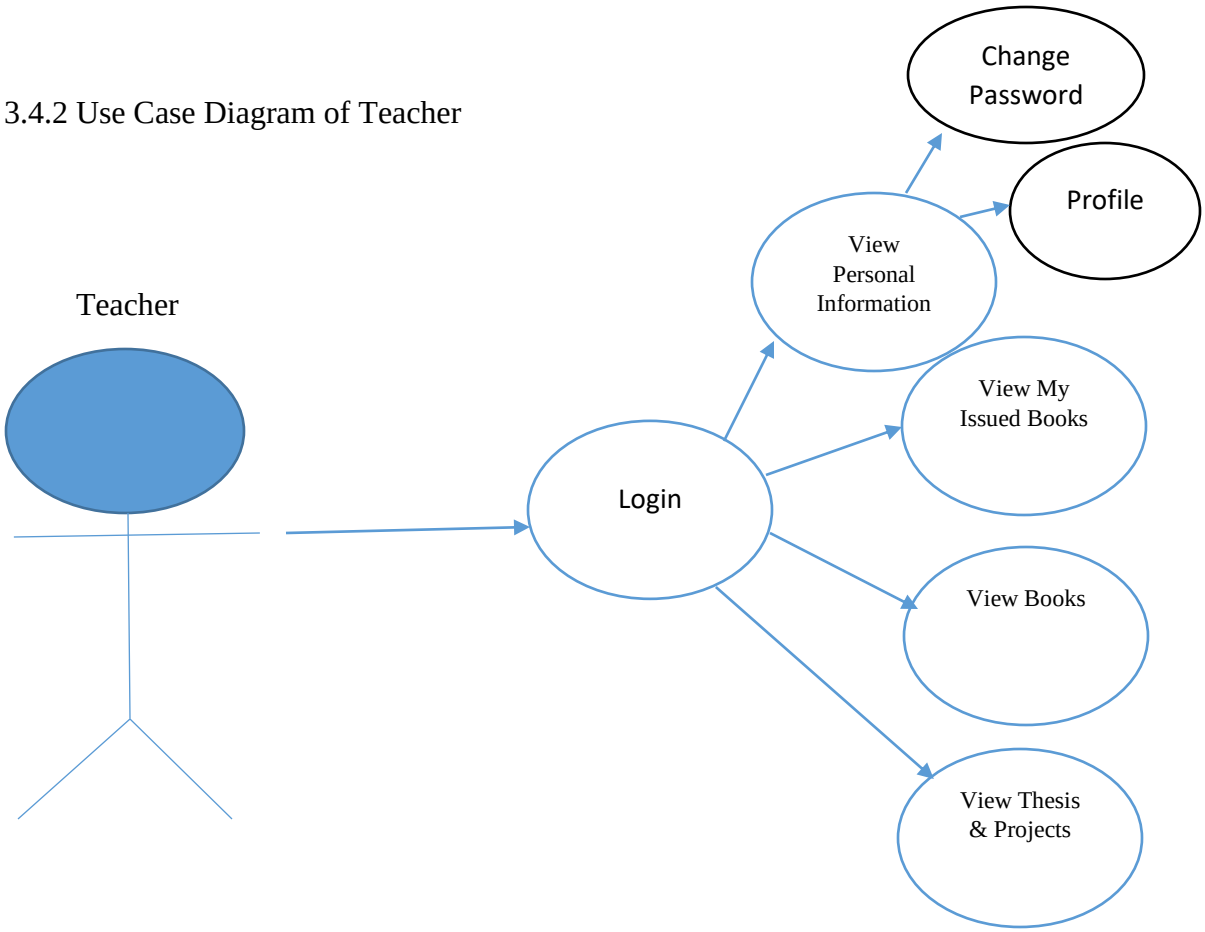


Fig: Use Case Diagram of Teacher

3.4.3 Use Case Diagram of Administrator

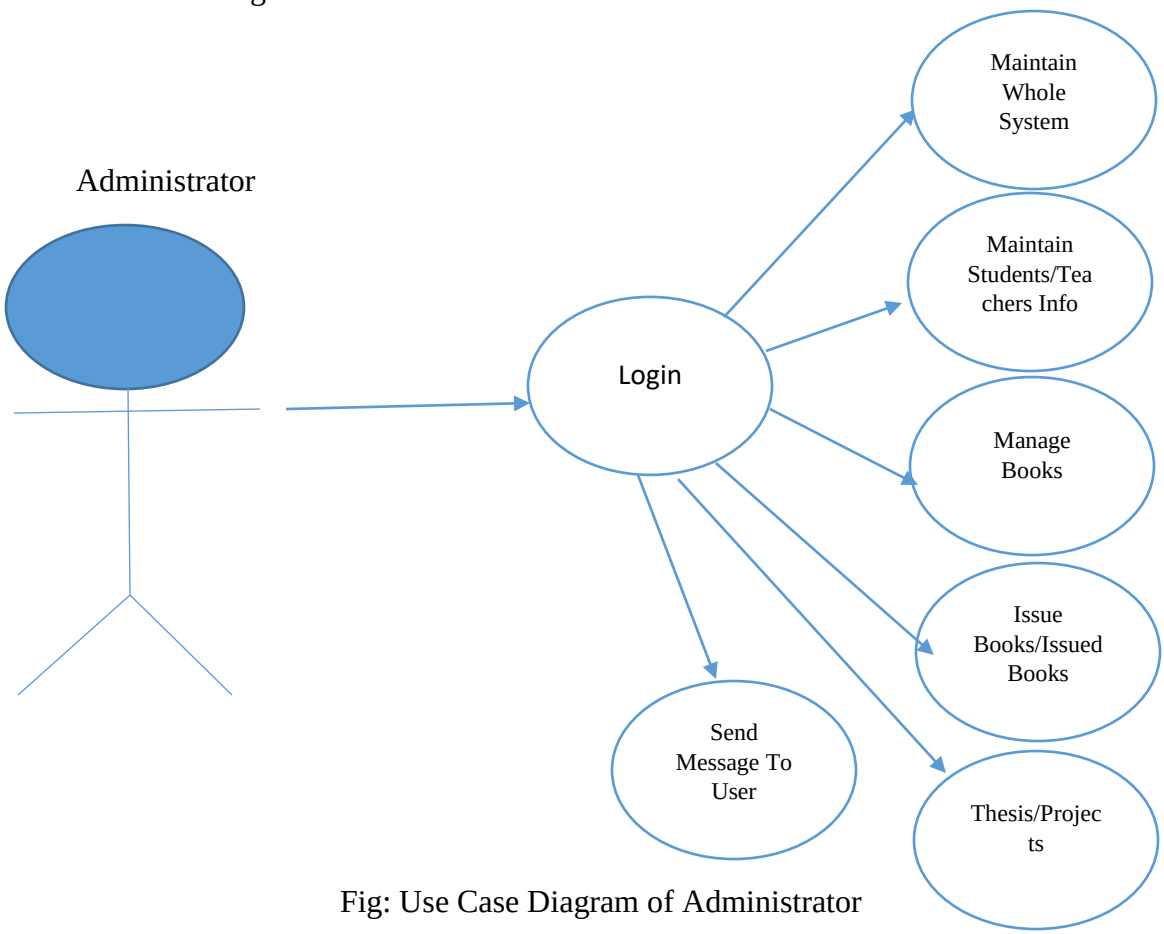
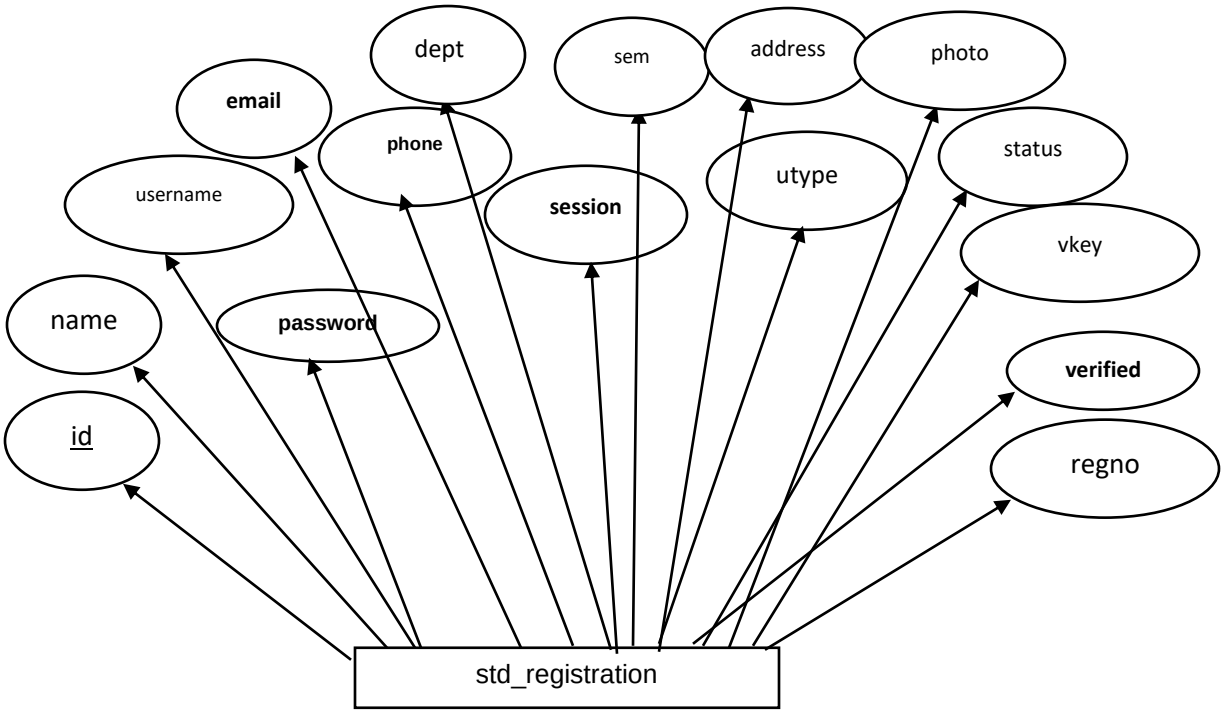
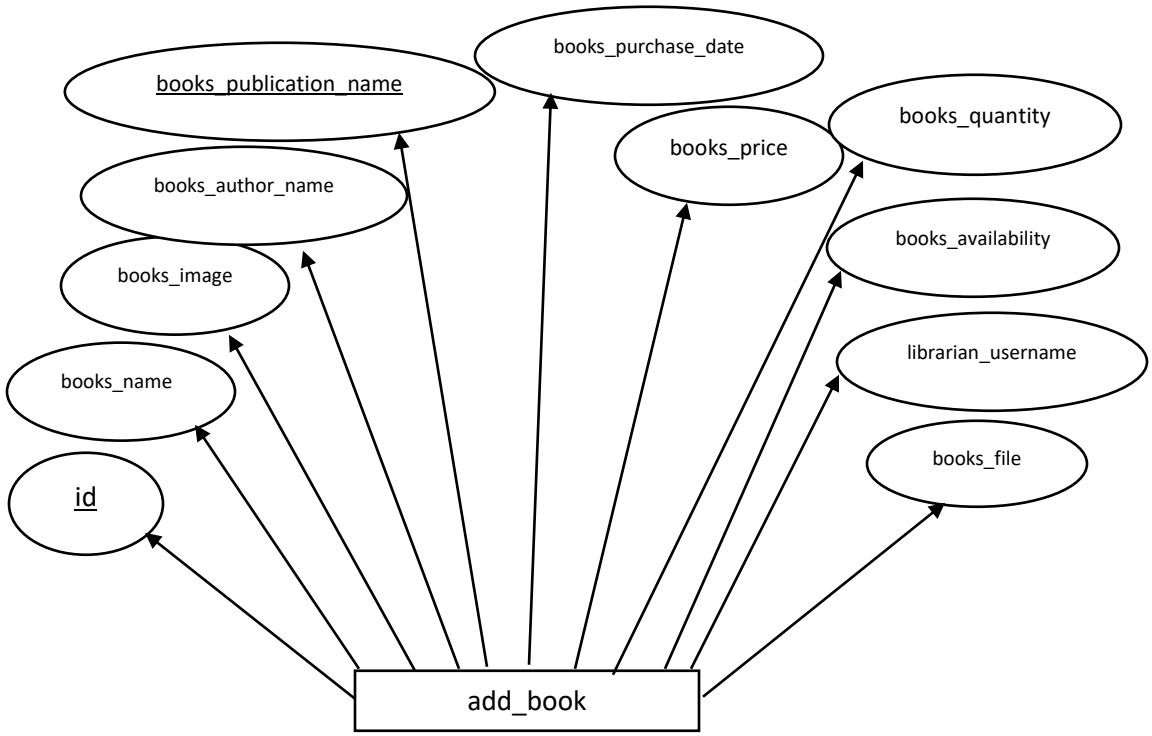


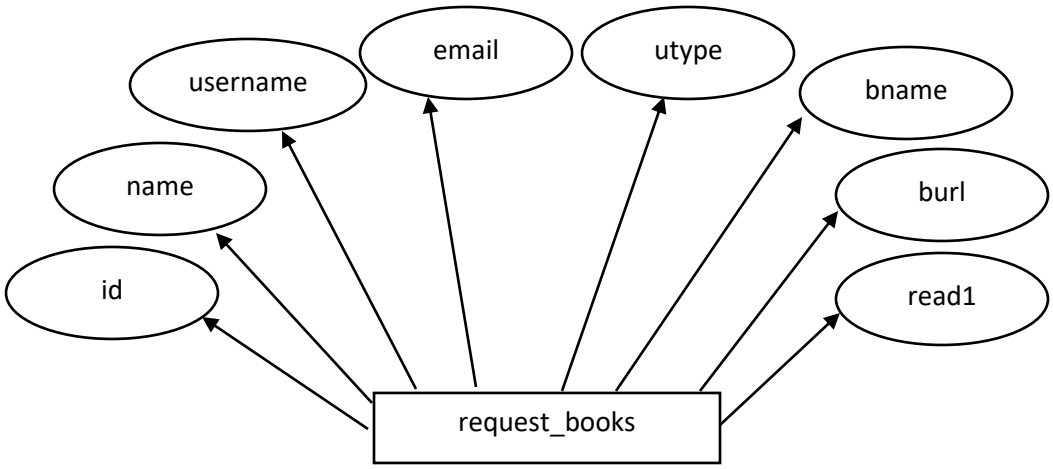
Fig: Use Case Diagram of Administrator

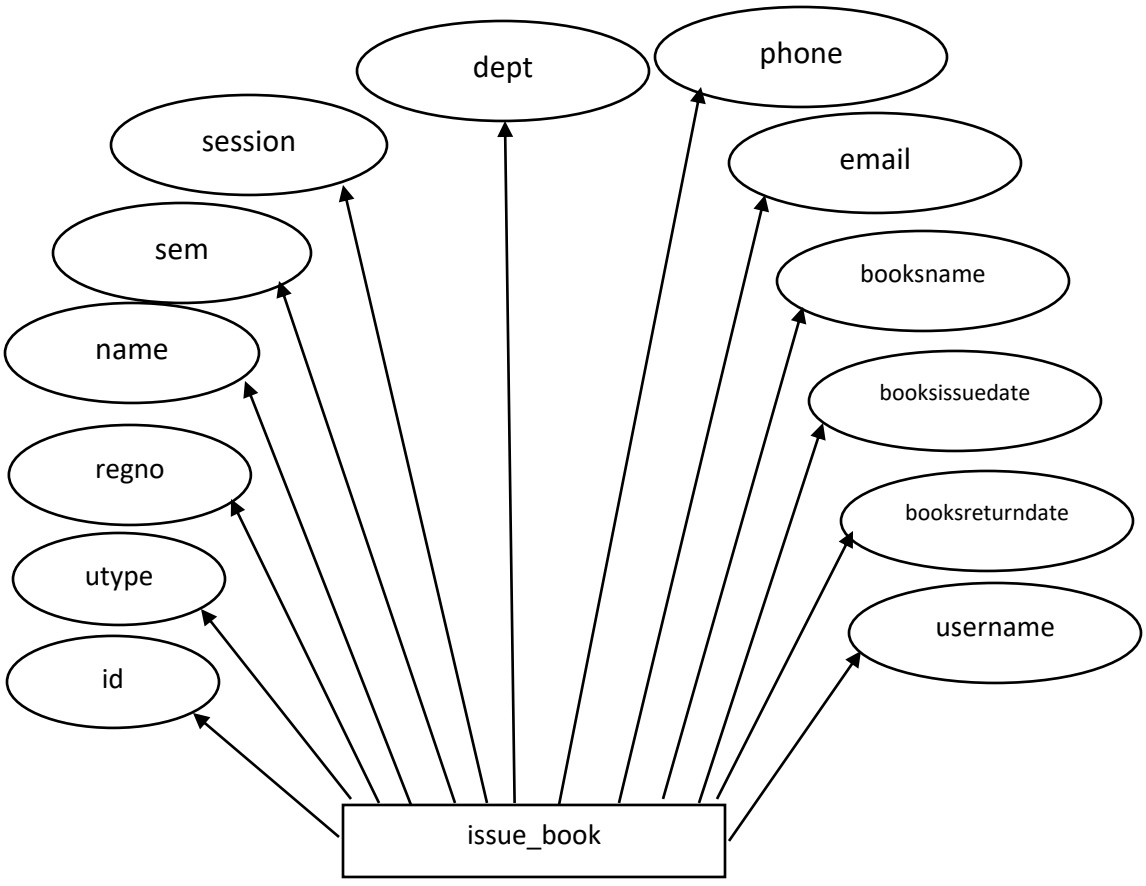
3.5 ER-Diagram

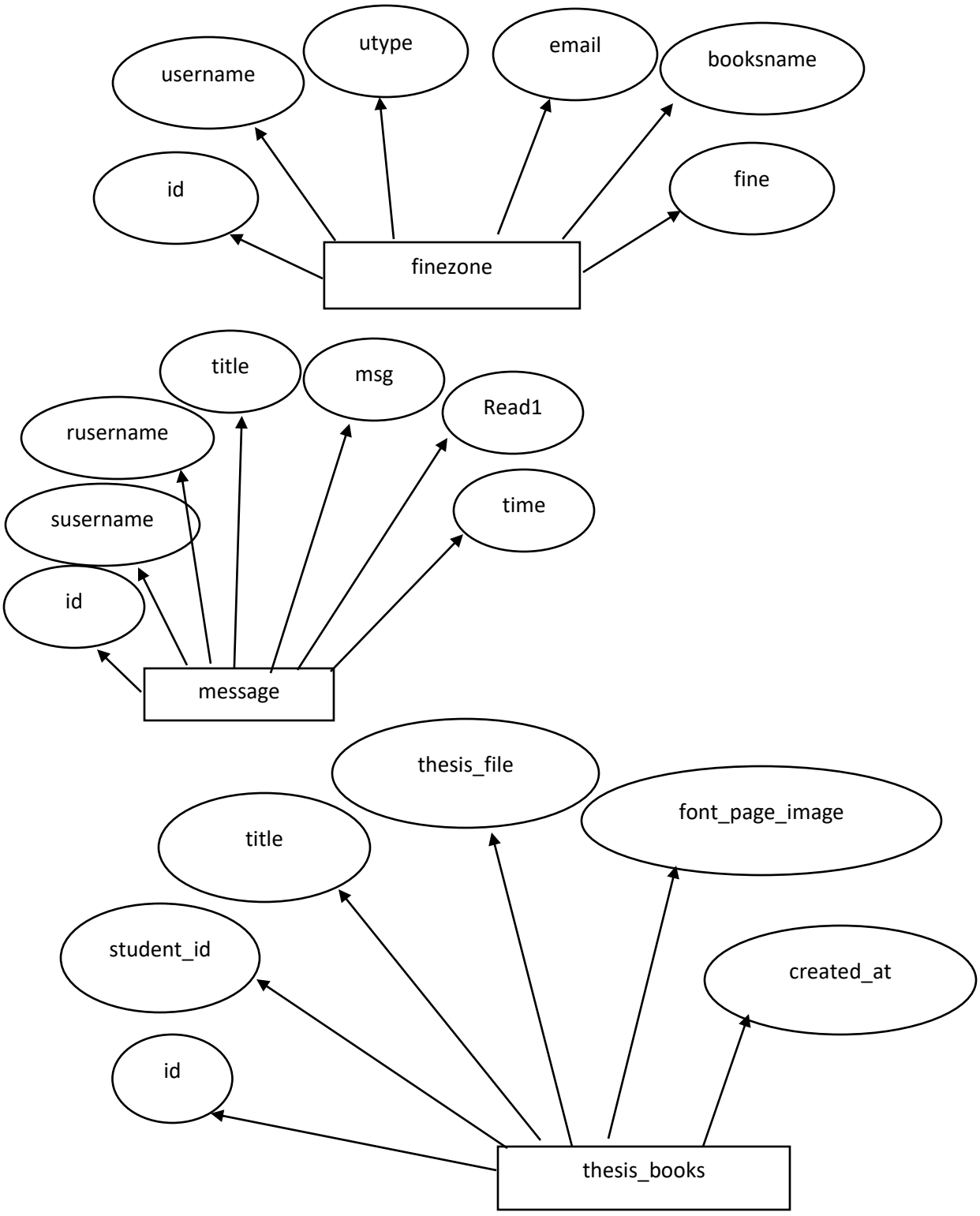
In software engineering, an entity–relationship model (ER model) is a data model for describing the data or information aspects of a business domain or its process requirements, in an abstract way that lends itself to ultimately being implemented in a database such as a relational database. The main components of ER models are entities (things) and the relationships that can exist among them, and databases.

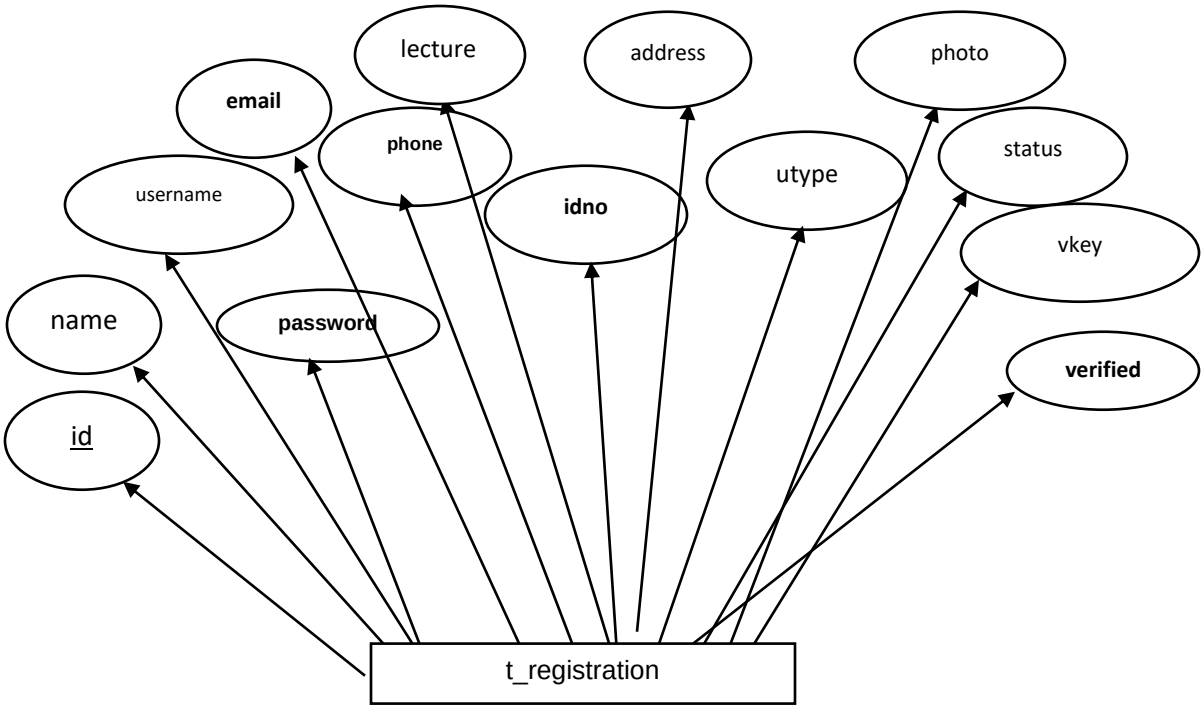

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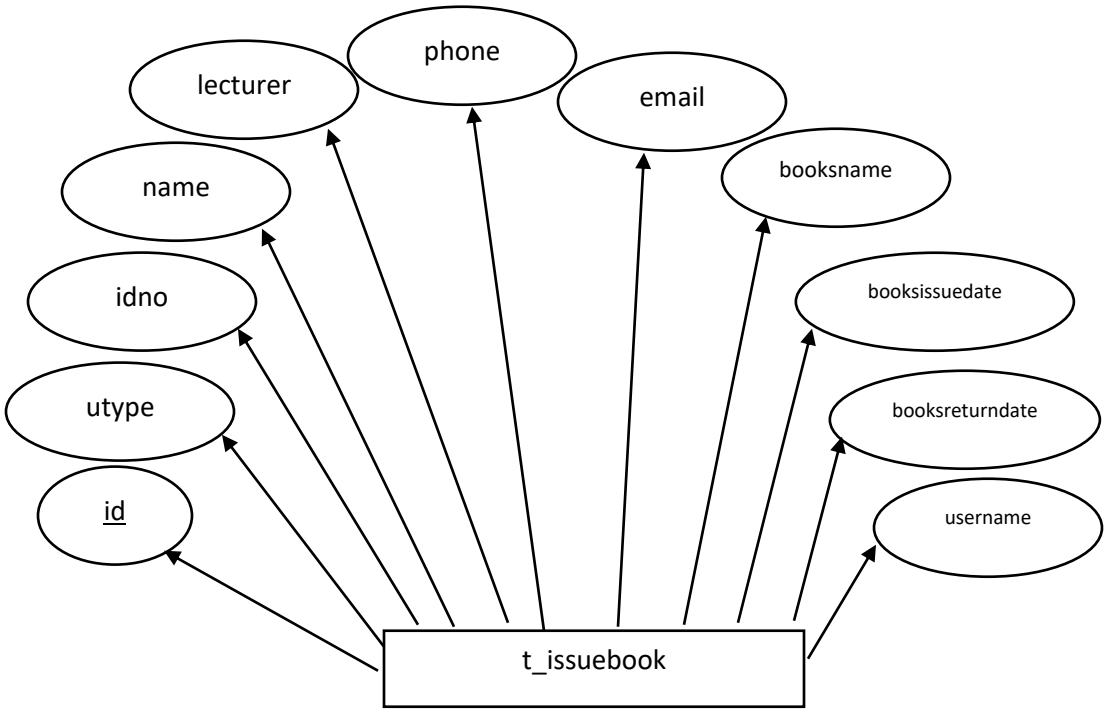

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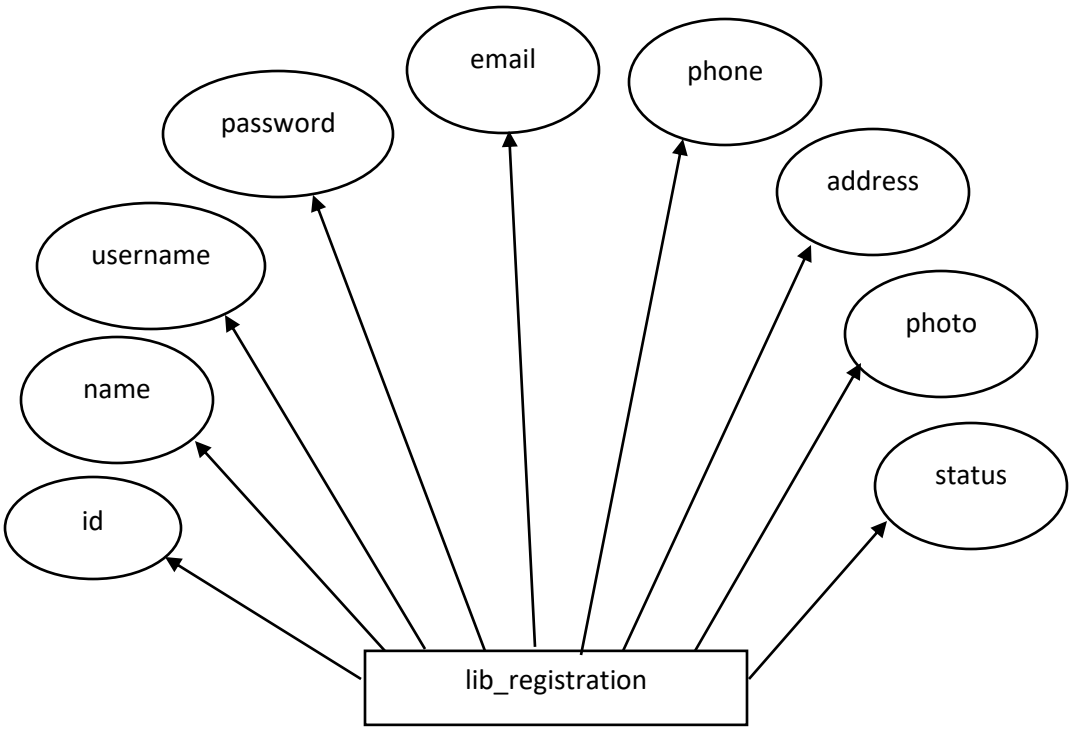

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CHAPTER 4

TOOLS AND TECHNOLOGY

4.1 Introduction

We are trying to develop web based software by using this framework in our backend. A simple UI for creating projects that offer support for PHP frameworks (Web Forms, MVC. Using HTML, CSS for front Design. Bootstrap, a layout and theming framework that provides responsive design and theming capabilities. Using MySQL for the database, MySQL is a universal database management tool that can be used with any relational database to perform administrative tasks such as importing/exporting data, generating test data, reverse engineering an existing database, comparing schema and data between databases or simply running SQL queries. Using JavaScript based JQuery and Ajax for make dynamic system.to hosting this software, we need a server, to use this by online.

4.1.1 Framework

In general, a framework is a real or conceptual structure intended to serve as a support or guide for the building of something that expands the structure into something useful. In computer systems, a framework is often a layered structure indicating what kind of programs can or should be built and how they would interrelate. Some computer system frameworks also include actual programs, specify programming interfaces, or offer programming tools for using the frameworks. A framework may be for a set of functions within a system and how they interrelate; the layers of an operating system; the layers of an application subsystem; how communication should be standardized at some level of a network; and so forth. A framework is generally more comprehensive than a protocol and more prescriptive than a structure.

4.1.2 HTML, CSS

Stands for "Hyper-Text Markup Language." This is the language that Web pages are written in. Also known as hypertext documents, Web pages must conform to the rules of HTML in order to be displayed correctly in a Web browser. The HTML syntax is based on a list of tags that describe the page's format and what is displayed on the Web page. Fortunately, the HTML language is relatively easy to learn. Even more fortunately (so much for good grammar), many Web development programs allow you to create Web pages using a graphical interface. These programs allow you to place objects and text on the page and the HTML code is written for you.Cascading Style Sheets (CSS) is a style sheet language used for describing the look and formatting of a document written in a markup language.

4.1.3 MySQL

MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP open source web application software stack (and other 'AMP' stacks). LAMP is an acronym for "Linux, Apache, MySQL, and Perl/PHP/Python. MySQL is a relational database management system (RDBMS), and ships with no GUI tools to administer MySQL databases or manage data contained within the databases. Users may use the included command line tools, or use MySQL "front-ends", desktop software and web applications that create and manage MySQL databases, build database structures, back up data, inspect status, and work with data records. The official set of MySQL front-end tools, MySQL Workbench is actively developed by Oracle, and is freely available for use.

4.1.4 JavaScript

An object-oriented computer programming language commonly used to create interactive effects within web browsers. JavaScript is a programming language commonly used in web development. It was originally developed by Netscape as a means to add dynamic and interactive elements to websites. While JavaScript is influenced by Java, the syntax is more similar to C and is based on ECMA Script, a scripting language developed by Sun Microsystems. JavaScript is a client-side scripting language, which means the source code is processed by the client's web browser rather than on the web server. This means JavaScript functions can run after a webpage has loaded without communicating with the server. For example, a JavaScript function may check a web form before it is submitted to make sure all the required fields have been filled out. The JavaScript code can produce an error message before any information is actually transmitted to the server.

4.1.5 JQuery

JQuery’s syntax is designed to make it easier to navigate a document, select DOM elements, create animations, handle events, and develop Ajax applications. JQuery is a JavaScript library that allows web developers to add extra functionality to their websites. It is open source and provided for free under the MIT license. In recent years, JQuery has become the most popular JavaScript library used in web development.

4.1.6 Web Server

A server is a running instance of an application capable of accepting request from the client and give response accordingly. Servers can run on any computer or dedicated computer, which isalso often referred to as "the server", In many cases, a computer can provide several services and have several servers running. The advantage of running servers on dedicated computer is security. For this reason, most of the servers are daemon processes and designed by the designers

in such a way that it can run on specific computer(s).Servers operate within client-server architecture. Servers are computer programs running to serve the requests of other programs, the clients. Thus, the server performs some tasks on behalf of clients. The clients typically connect to the server through the network but may run on the same computer. In the context of Internet Protocol (IP) networking, a server is a program that operates as a socket listener.Servers often provide essential services across a network, either to private users inside a large organization or to public users via the Internet. Typical computing servers are database server, file server, mail server, print server, web server, gaming server, and application server.

4.2 System Requirements

The following performance characteristics should be taken care of while developing the system:

Security: The security of subsystem supports the dividing users into several groups. Each group has its own set of rights for viewing or changing data.

User friendliness: The system should be easy to learn and understand so that new user or naïve user can also use the system effectively, without any difficulty.

The highest reliability: Data management system is based on transactions. Transactional system never allows your data to be lost or corrupted because of accidents such as electricity cutting or hardware errors.

Multiuser work over Online: You'll be able to share data over network.

Error handling: Response to user errors and the undesired situations should be taken care of to ensure that the system operates without halting.

Robustness: The system should recover from undesired events without human interventions.

4.3 System Specifications

i. Hardware Requirements

Processor: Quad core processor.

RAM: 2GB or more

Hard disk: 20 GB or more

ii. Software Requirements

Operating System: Any

Front end: HTML, CSS, JavaScript

Back end: PHP , MYSQL

CHAPTER 5

User Interface and Implementation

5.1 User Interface

User interface or form design is the part, by which user can see the whole system. And use the system by their wish. System is implemented with the access control of three user panel module, these are**:**

1. Admin User

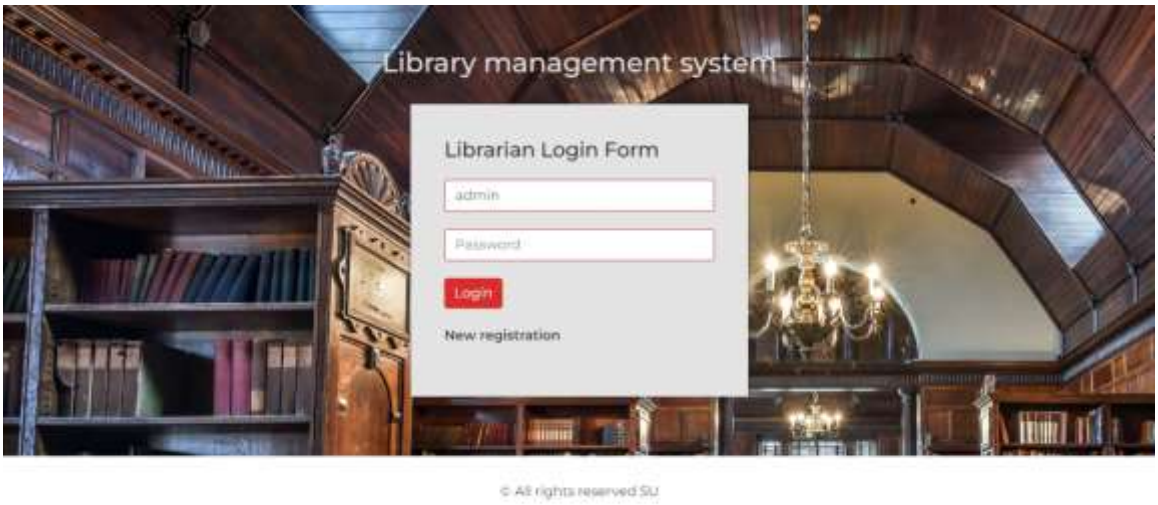
2. Teacher/Faculty Member

3. Students

4. End User/Website of Institution

5.1.1 Admin User

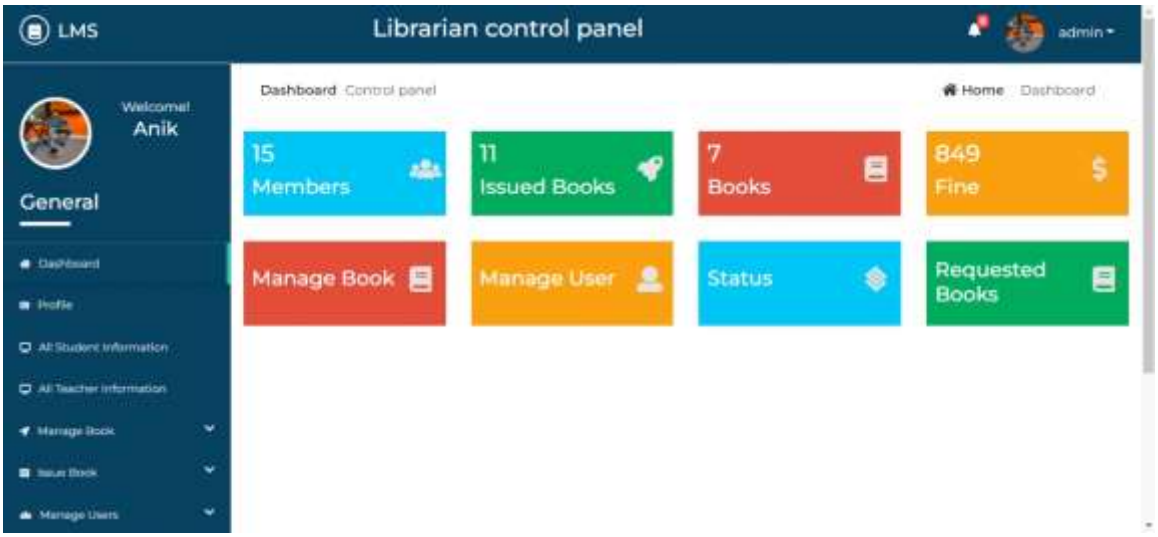
The admin is responsible for uploading the sheets generated. He can add the subject marks and make any kind of modifications like storing, updating, deleting. Apart from the regular results, the supplementary results can also be uploaded by the admin.



5.1.1 Fig: Admin User view

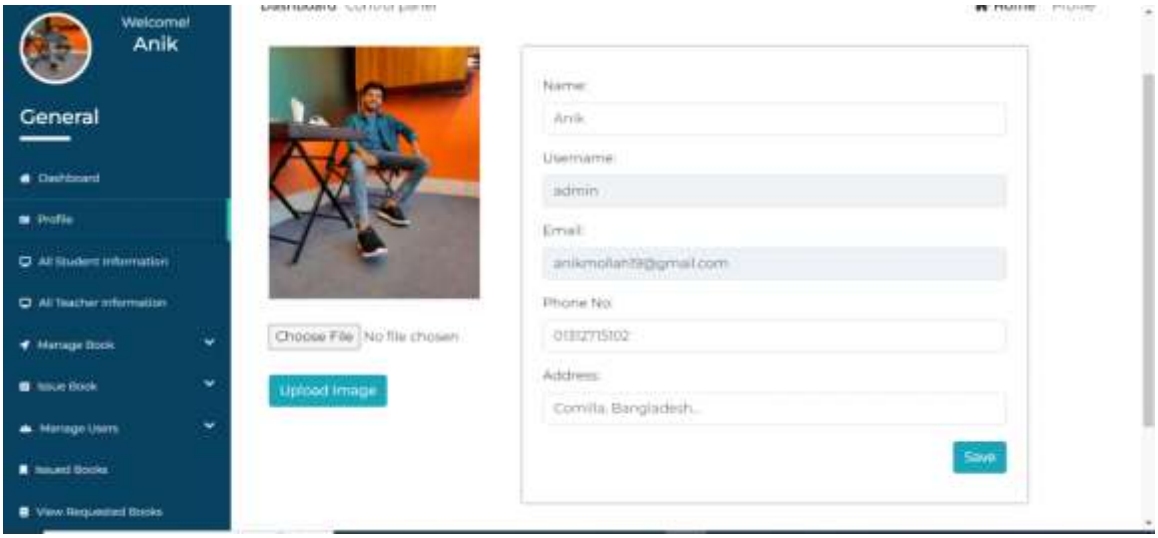
5.1.2 Admin Dashboard

This is the Admin Dashboard where admin can see the current semester name and registered student number for this semester on the top of it.



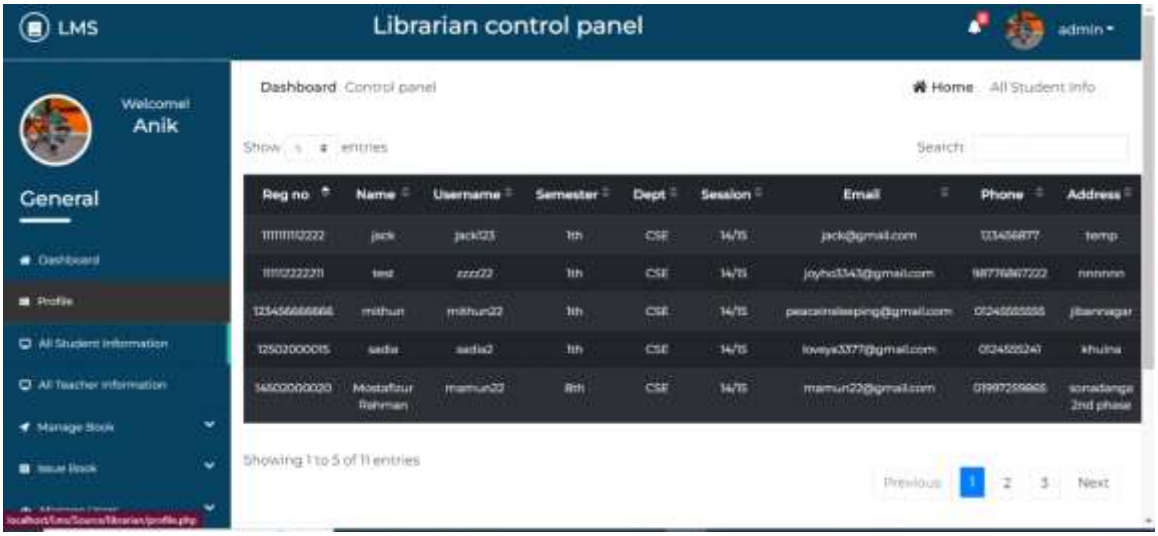
5.1.2 Fig: Admin Dashboard view

5.1.3 Admin profile



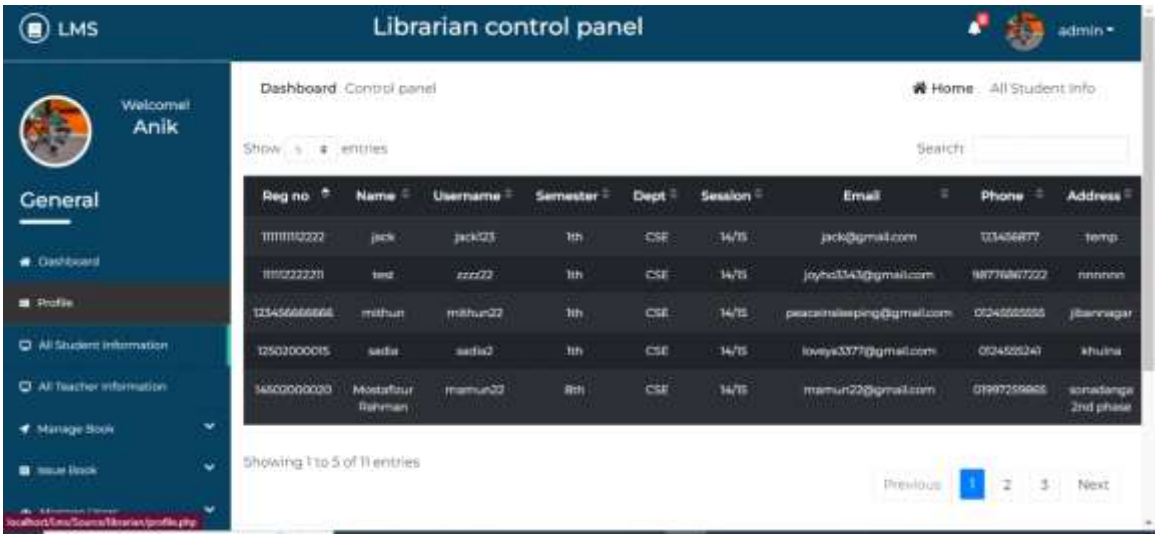
5.1.3 Fig: Admin Profile view

5.1.4 Admin view all student information



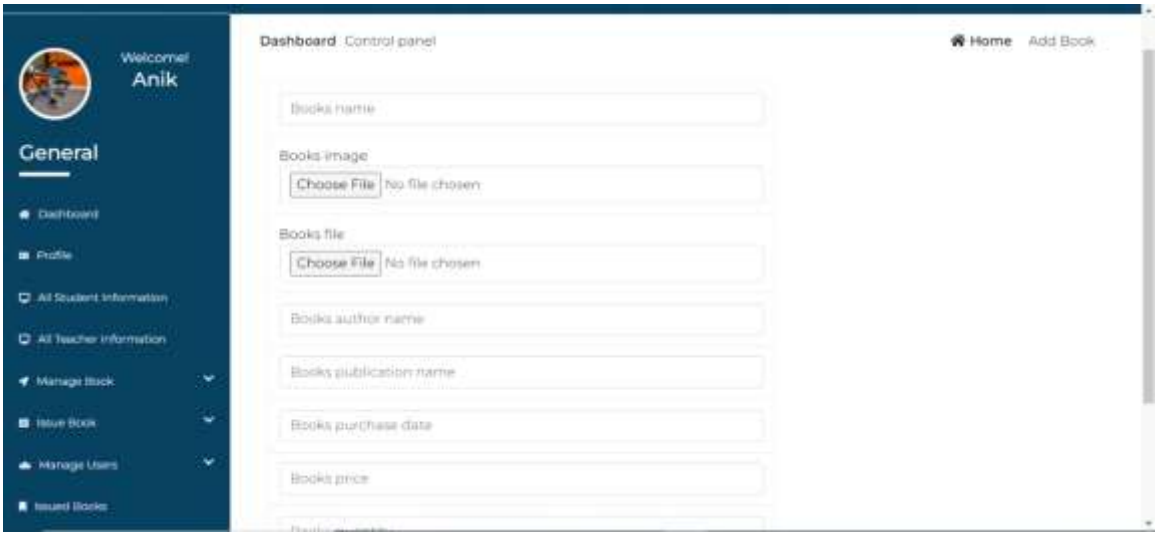
5.1.4 Fig: Admin all student information view

5.1.5 Admin view all teacher information



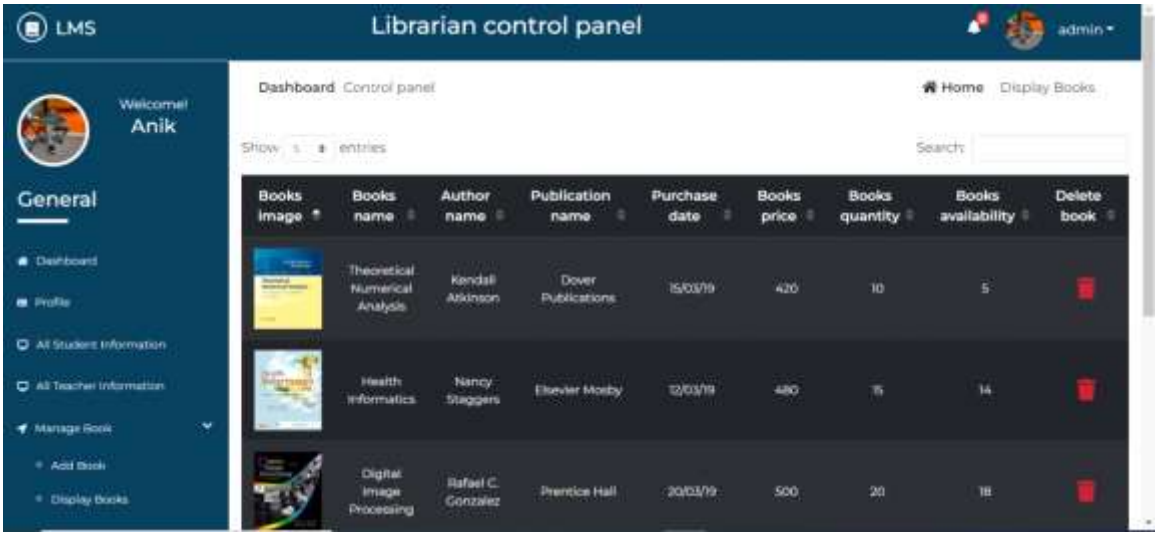
5.1.5 Fig: Admin all Teacher information view

5.1.6 Add books view



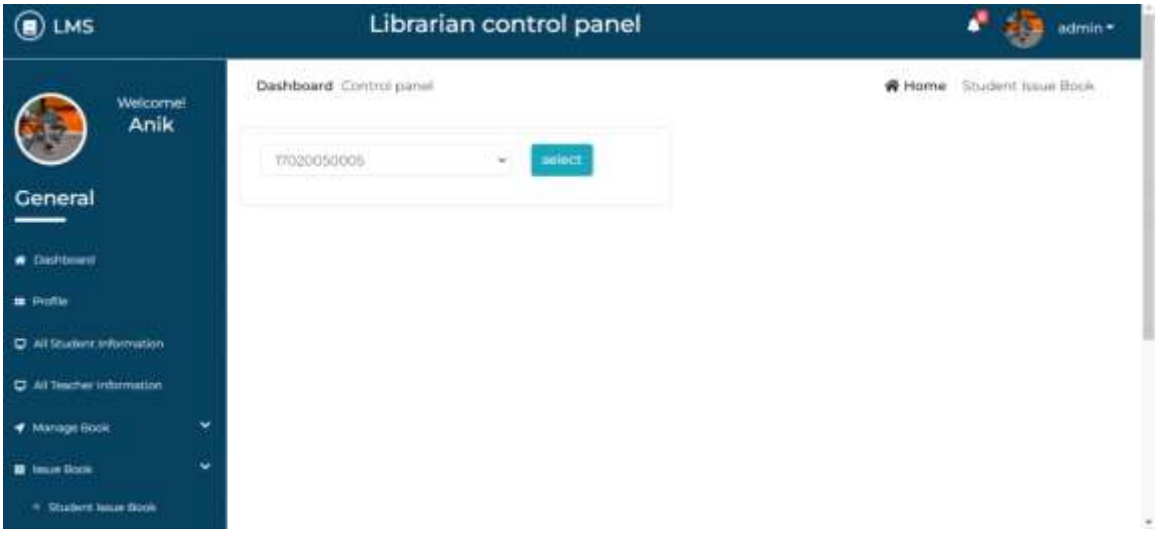
5.1.6 Fig: Add books view

5.1.7 Display books view



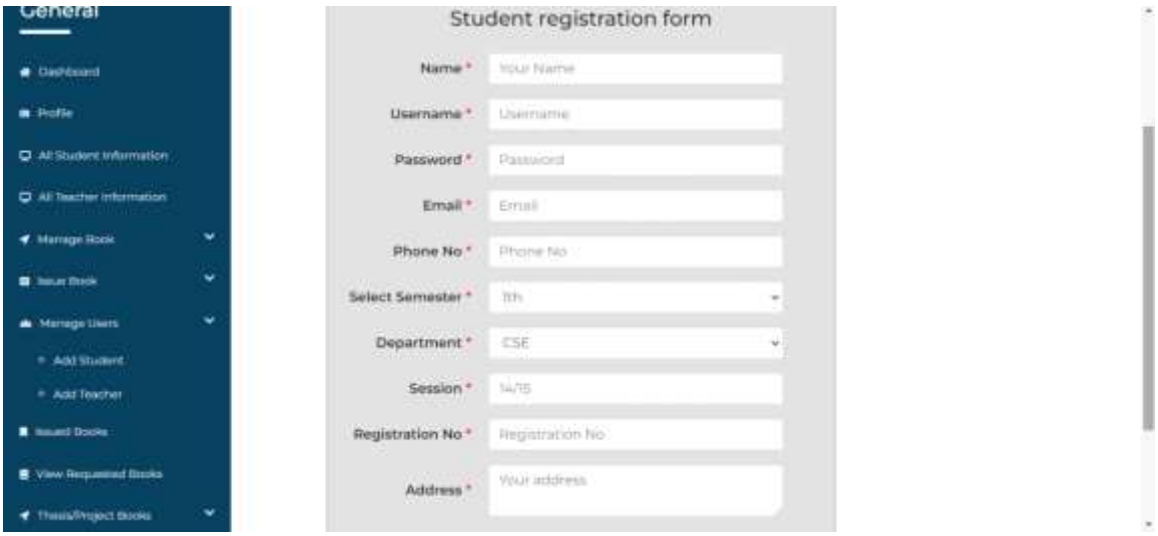
5.1.7 Fig: Display books view

5.1.8 Student issue books



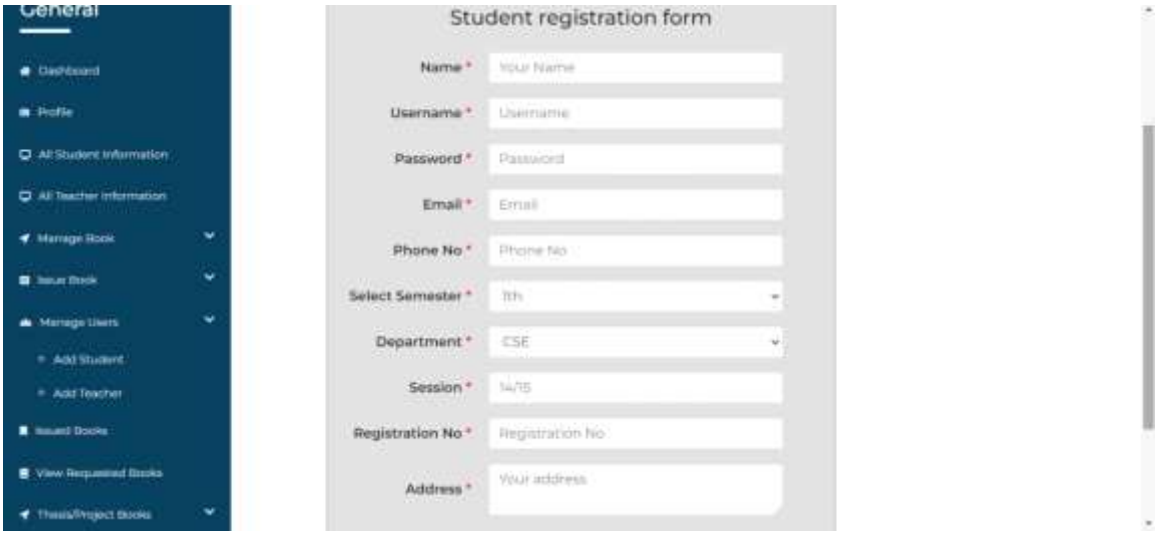
5.1.8 Fig: Student issue books

5.1.9 Add student/student registration from



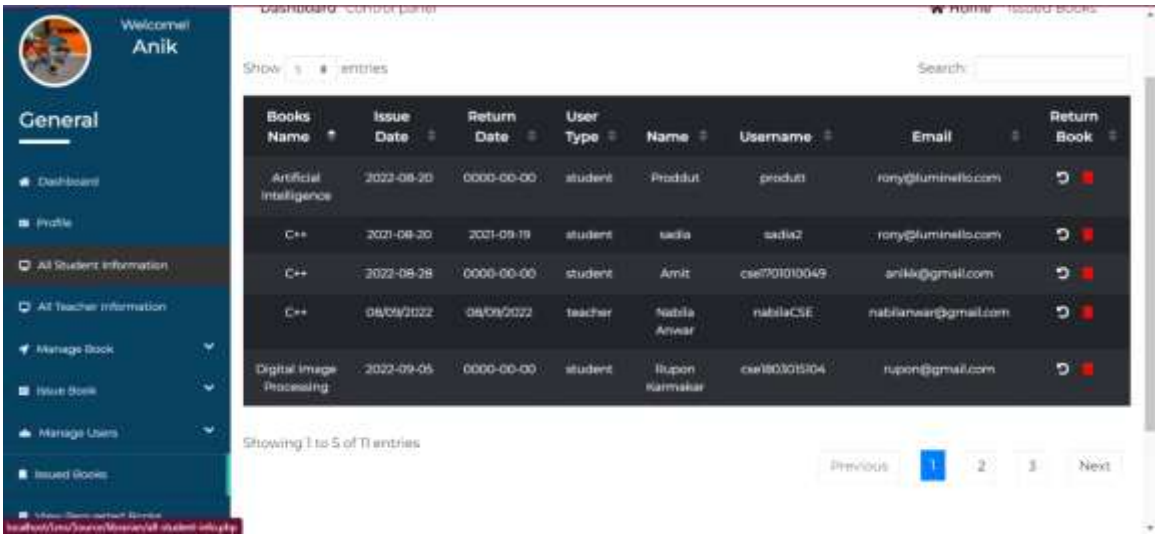
5.1.9 Fig: Add student/student registration from view

5.1.10 Add teacher / teacher registration from



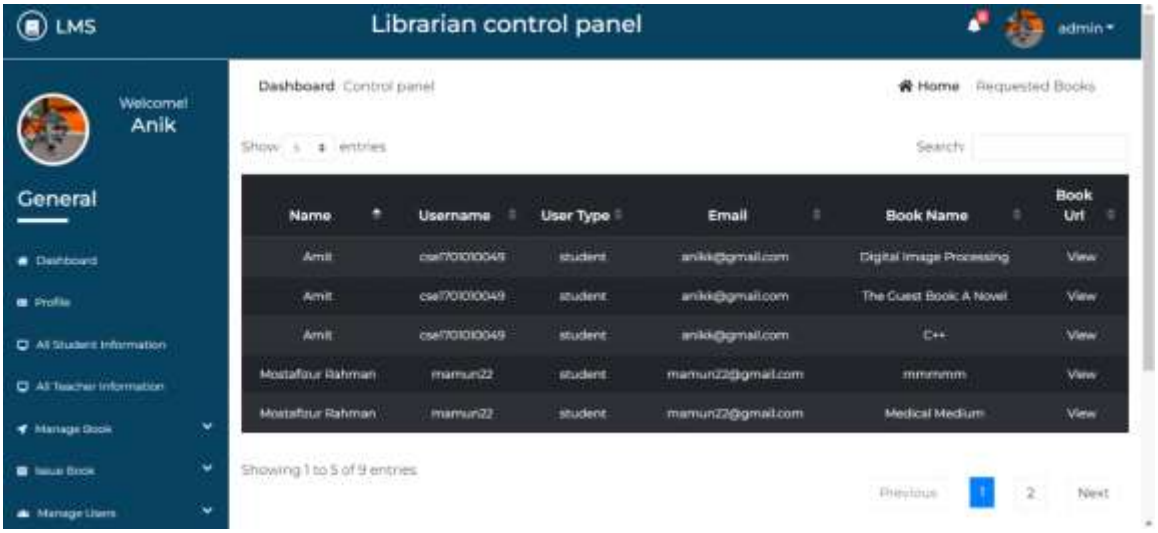
5.1.10 Fig: Add teacher / teacher registration from view

5.1.11 Issued books



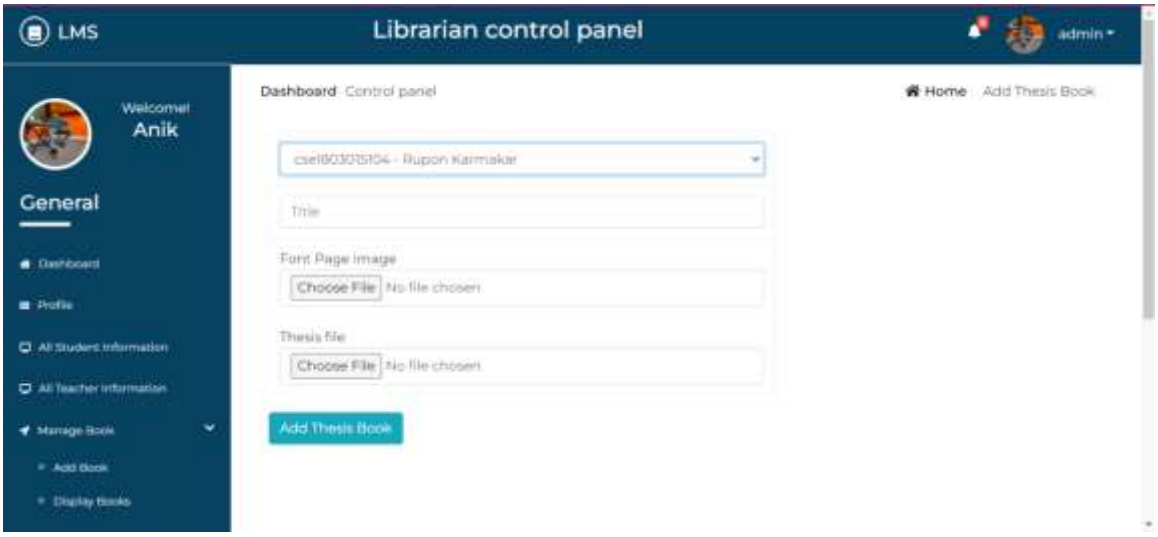
5.1.11 Fig: Issued books view

5.1.12 View requested books



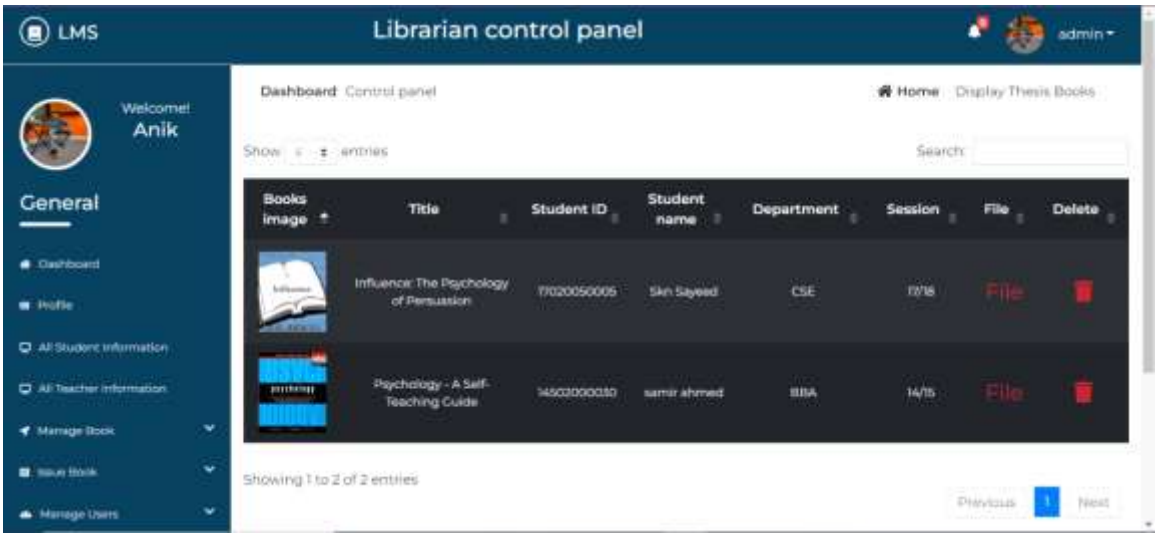
5.1.12 Fig: View requested books view

5.1.13 Student thesis book Add from



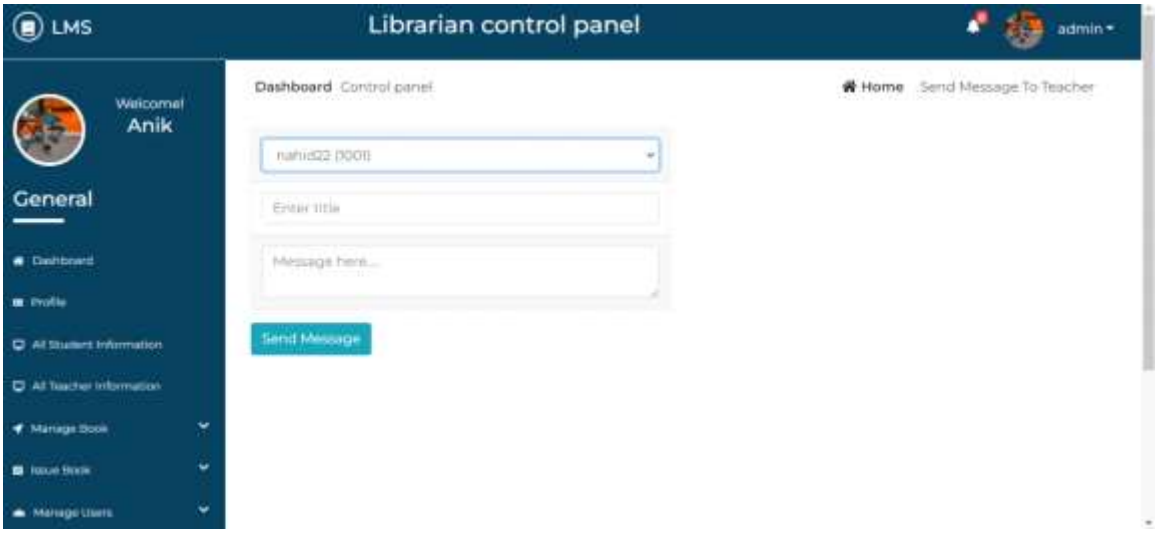
5.1.13 Fig: Student thesis book Add from view

5.1.14 Display thesis books



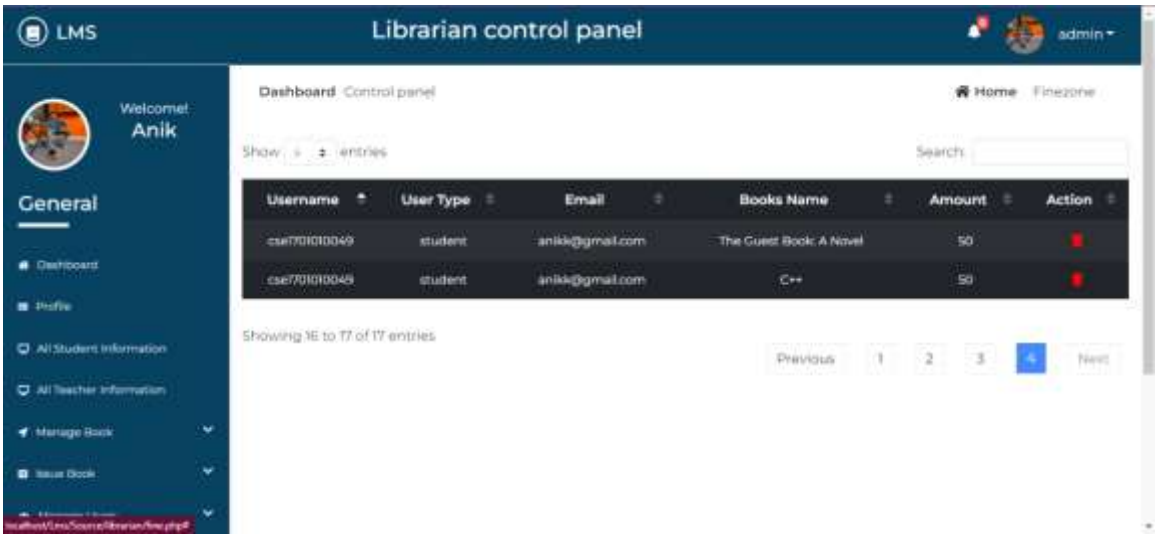
5.1.14 Fig: Display thesis books view

5.1.15 Send message to user



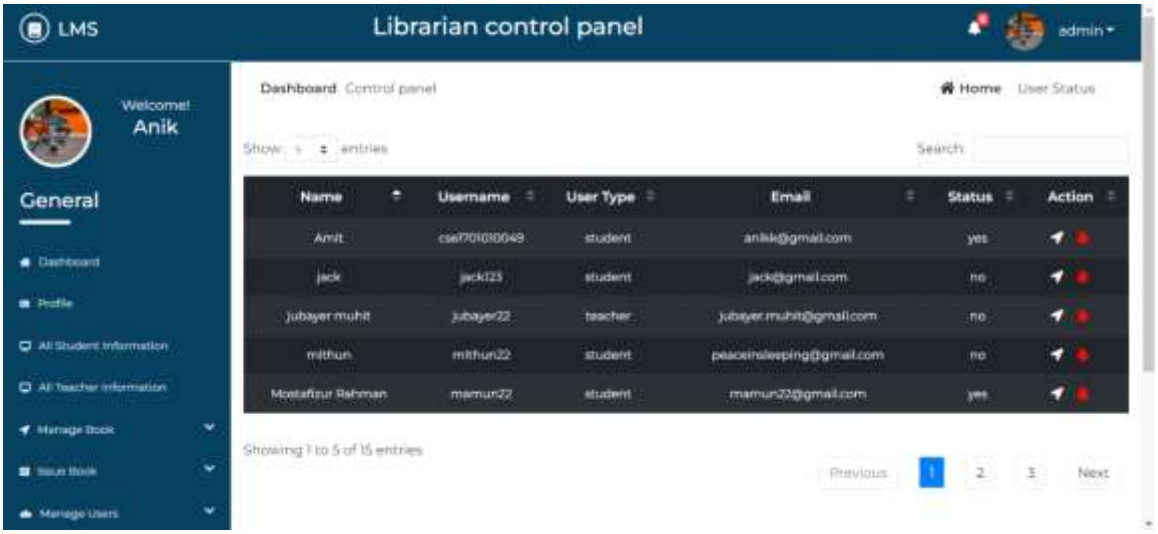
5.1.15 Fig: Send message to user view

5.1.16 Fine view



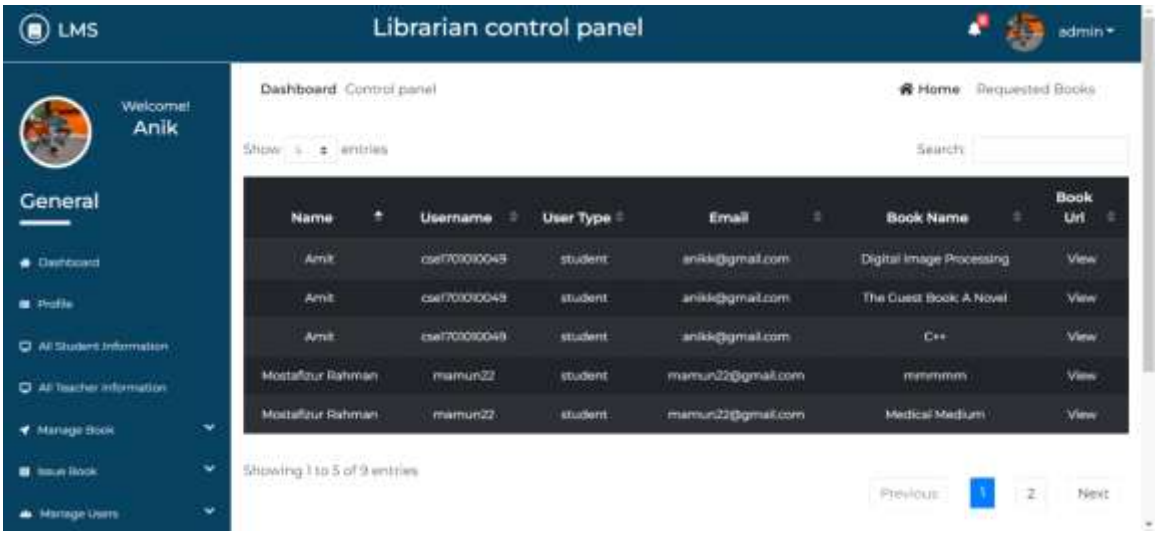
5.1.16 Fig: Fine view

5.1.17 Status view



5.1.17 Fig: Status view

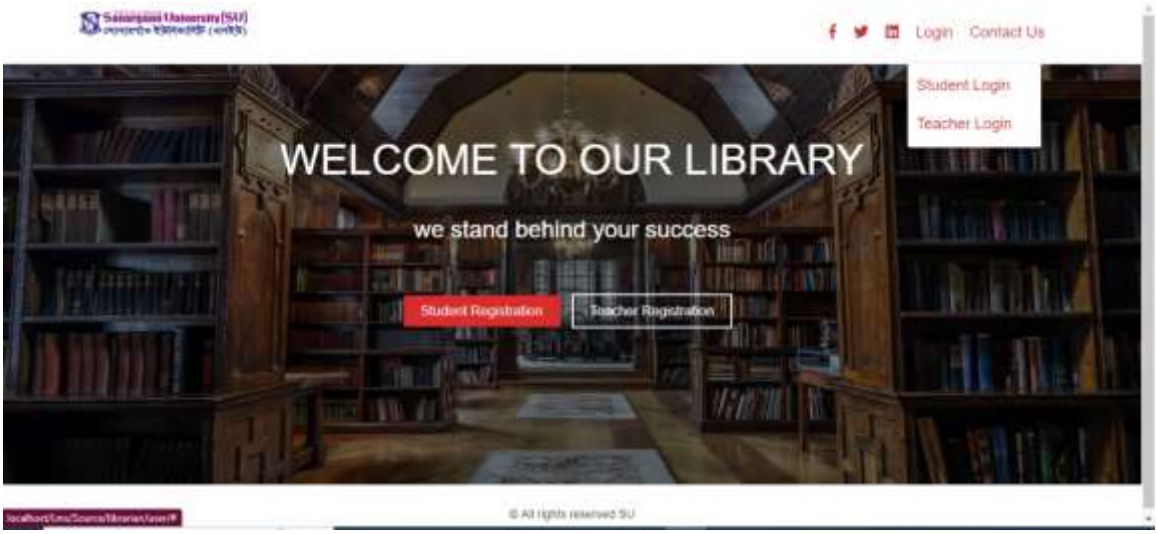
5.1.18 Notification view

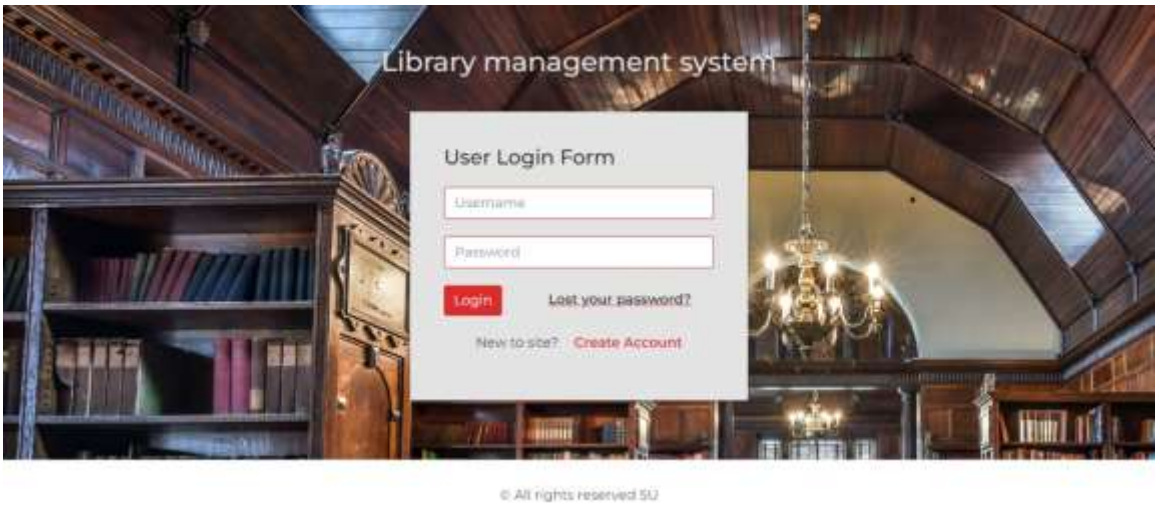


5.1.18 Fig: Notification view

5.2 Faculty Login

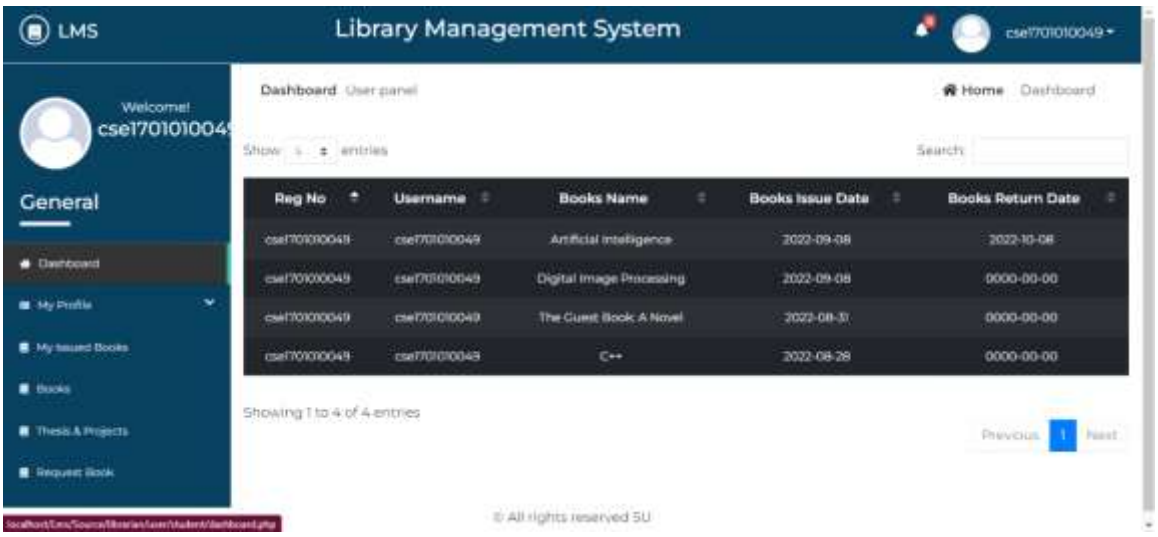
5.2.1This the registration/ Login Window of Faculty members





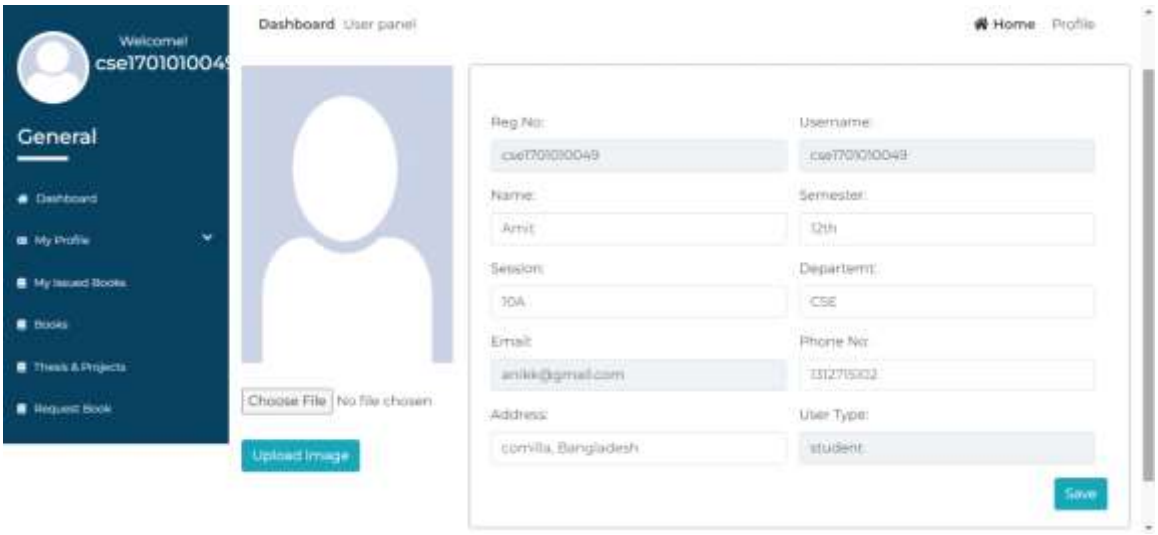
5.2.1 Fig: Registration/Login view

5.2.2 Dashboard of Faculty members



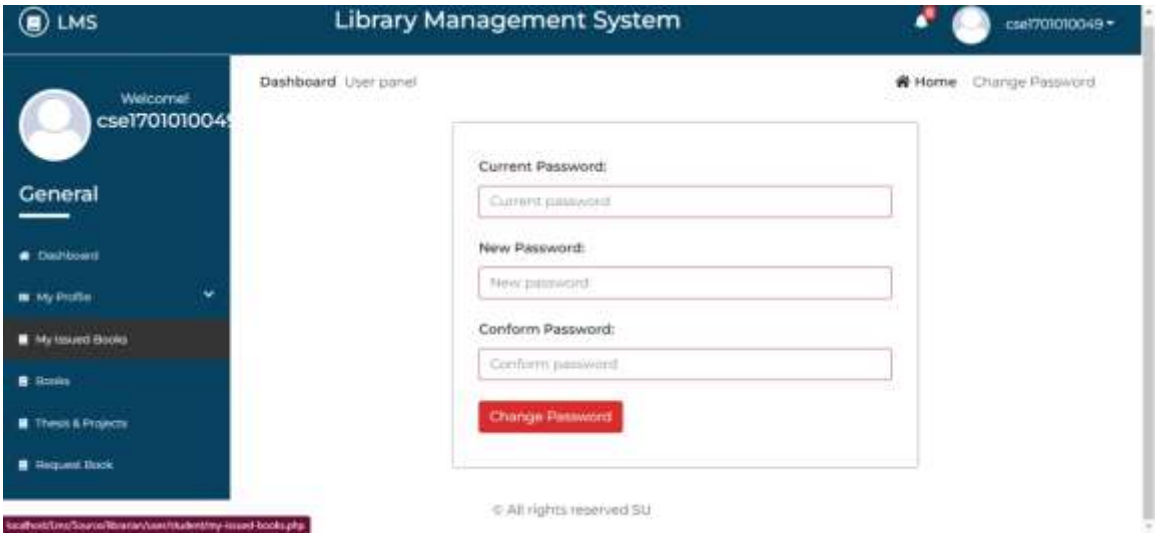
5.2.2 Fig: Dashboard of Faculty members view

5.2.3 Profile or Personal Information Page of Faculty members



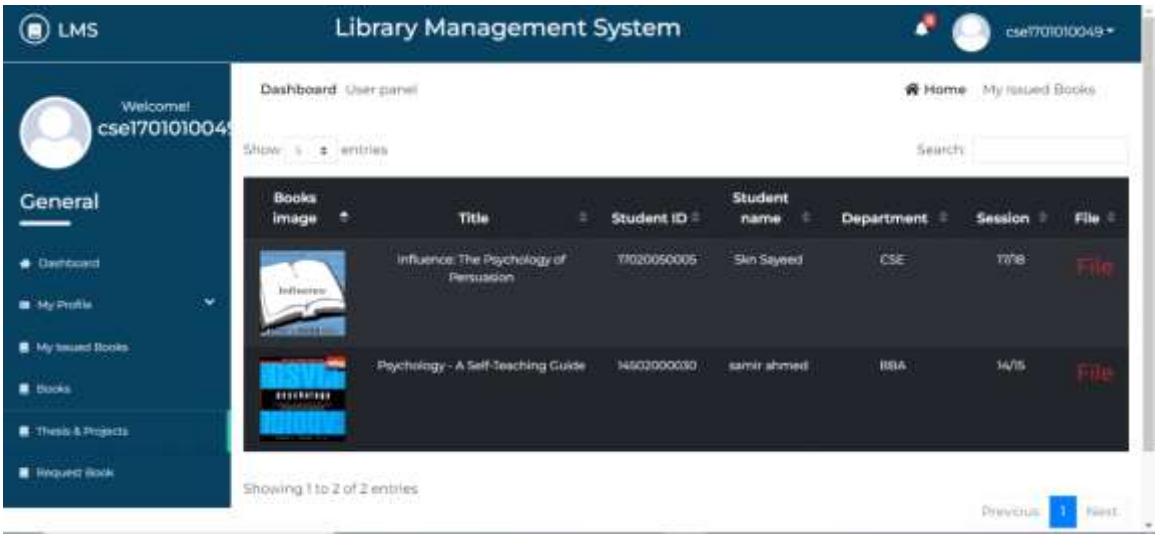
5.2.3 Fig: Profile or Personal Information Page of Faculty members

5.2.4 Password change form of Faculty members



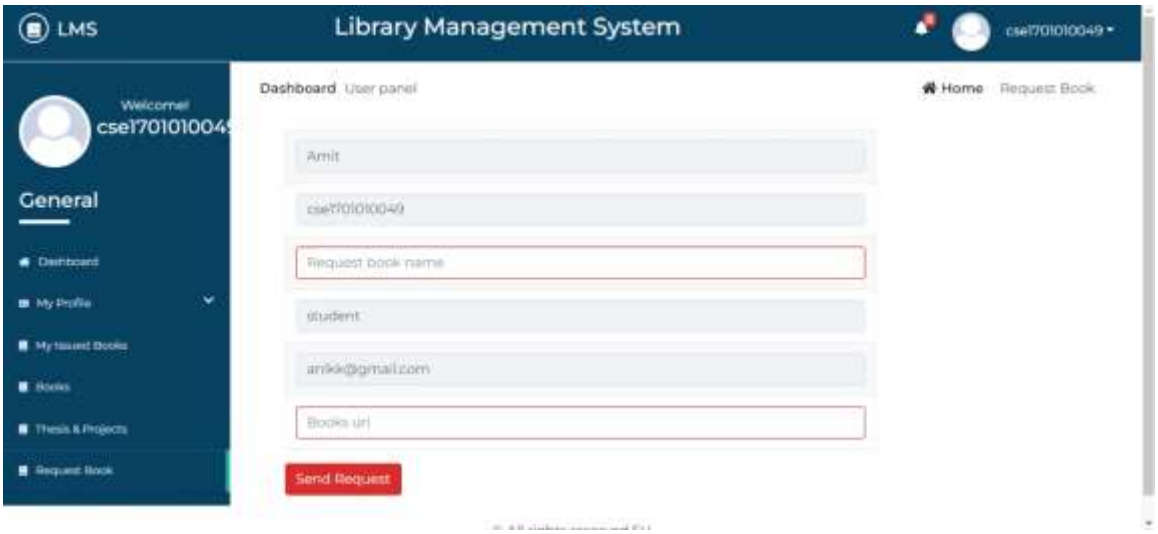
5.2.4 Fig: Password change form of Faculty members view

5.2.5 Project and thesis view for student and teacher



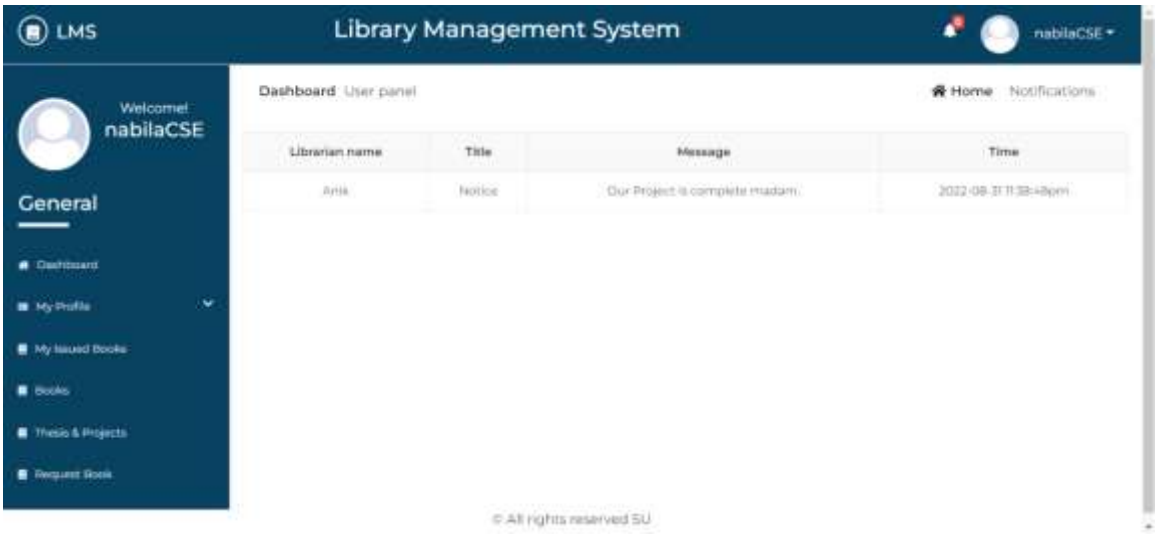
5.2.5 Fig: Project and thesis view for student and teacher view

5.2.6 Book request from



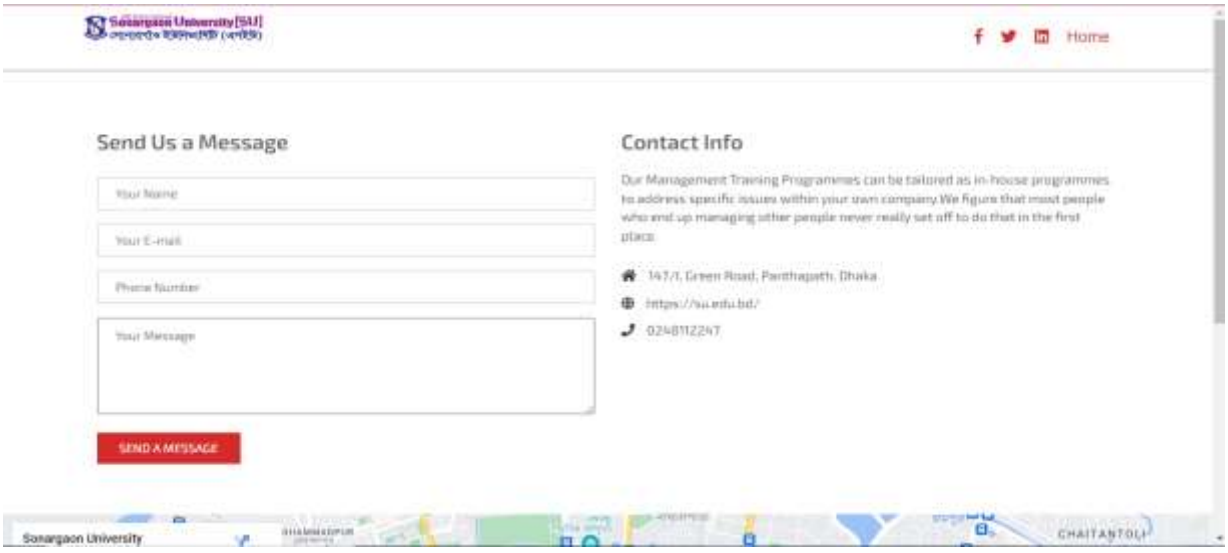
5.2.6 Fig: Book request from view

5.2.7 Notification view



5.2.7 Fig: Notification view

5.2.8 Contact us view



5.2.8 Fig: Contact us view

CHAPTER 6

CONCLUSION

6.1 Conclusion

This website provides a computerized version of library management system which will benefit the students as well as the staff of the library. It makes entire process online where student can search books, staff can generate reports and do book transactions. It also has a facility for student login where student can login and can see status of books issued as well request for book or give some suggestions. It has a facility of teacher's login where teachers can add lectures notes and also give necessary suggestion to library and also add info about workshops or events happening in our university or nearby universities in the online notice board.

6.2 Future Scopes:

- Add accounts part to this existing software.
- Add automatic class routine creation
- Add student class attendance
- Add Library management system
- Admission process
- And Project or Thesis management system

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